Vol. 925 Number 4

OFFICIAL GAZETTE

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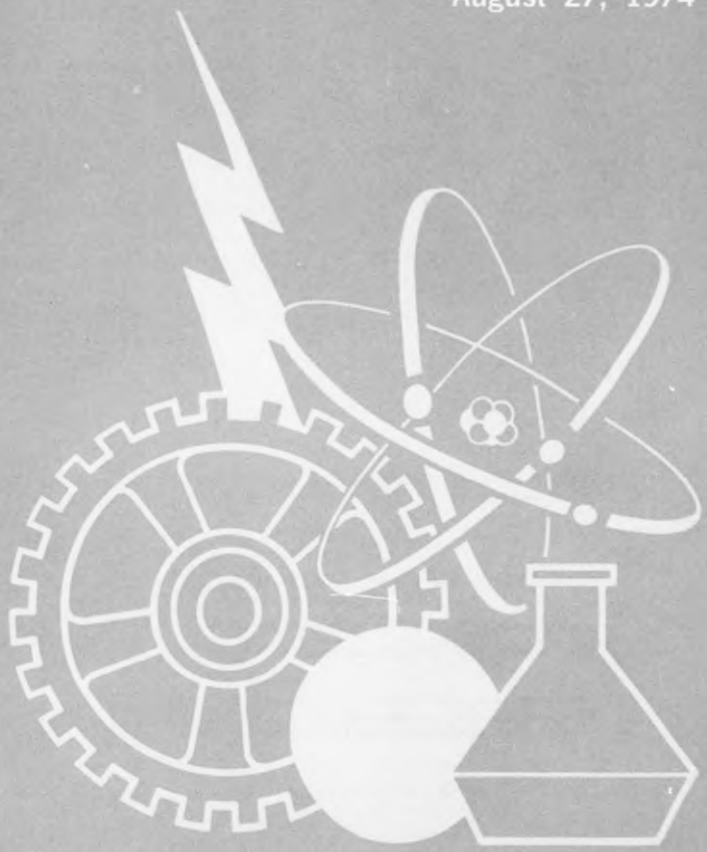
PATENTS

August 27, 1974



U. S. DEPARTMENT OF COMMERCE
Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

August 27, 1974 Volume 925 Number 4

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PATENT OFFICE NOTICES

Use of Metric System of Measurements in Patent Applications

In order to minimize the necessity in the future for converting dimensions given in the English system of measurements to the metric system of measurements when using printed patents as research and prior art search documents, all patent applications are strongly encouraged to use *either* (1) only metric (S.I) units, or (2) English units together with their metric system equivalents, when describing their inventions in the specifications of patent applications. This practice, however, is not being made mandatory at this time.

The initials S.I. stand for "Systeme International d'Unites," the French name for the International System of Units, a modernized metric system adopted in 1960 by the International General Conference of Weights and Measures based on precise unit measurements made possible by modern technology.

This request is made as part of the long-range program for conversion to metric units currently being conducted by the Federal Government.

Publications dealing with the metric system are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 and the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

C. MARSHALL DANN,
July 1, 1974. *Commissioner of Patents.*

Calculation of Issue Fees

Effective October 1, 1974, the Patent Office in calculating the balance of issue fee due, after payment of the Base Issue Fee specified by the Notice of Allowance, shall charge at the rate of $10 a page, as provided in 35 USC 41, for each printed page of specification (including claims) for which payment has not theretofore been received. As the Base Issue Fee includes a $10 charge for one printed page of specification, a balance of fee will be due for each patent which consists of more than one printed page. A "page" consists of one side of a printed sheet containing any amount of specification (including claims). A notification of the Balance of Issue Fee Due will be mailed in each such case along with the original patent grant.

The notice of February 4, 1970 published in the OFFICIAL GAZETTE [872 O.G. 1] and reproduced in the current "Consolidated Listing of Recent Official Gazette Notices . . ." [Item 53] is rescinded as of close of business September 30, 1974.

WILLIAM I. MERKIN,
Aug. 1, 1974. *Assistant Commissioner for Administration.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents on or before Sept. 23, 1974.

Capozi, Louis Joseph, 39–A Meadow Green Circle, Englishtown, N.J. 07720

Flint, Cort Ray, Jr., 114 Westchester Drive, Greenville, S.C. 29601

Gottman, James F., 310 N. Village Drive, Centerville, Ohio 45459

Guida, Antonio F., 6539 Little Falls Road, Arlington, Va. 22213

Langer, Thomas, 90 Laurel Hill Terrace, #4G, New York, N.Y. 10033

Marcus, Irving, 8411 Spencer Court, Chevy Chase, Md. 20015

Overholser, J. Spencer, P.O. Box 106, Oley, Pa. 19547

Saalbach, Herman K., 6019 Brunswich St., Springfield, Va. 22150

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,561,489, Bloch and Hansen, METHOD AND MEANS FOR CHEMICAL ANALYSIS BY NUCLEAR INDUCTIONS, **filed** June 4, 1971, D.C., S.D.N.Y., Doc. 71–C–2506, *Varian Associates* v. *Brucker Scientific, Inc.* Filed stipulation and order of dismissal with prejudice, Mar. 1, 1974.

2,729,551, C. C. Cohn, SURFACE TREATMENT OF ALUMINUM AND ITS ALLOYS, **filed** Feb. 8, 1974, D.C. Min. (Minneapolis), Doc. C–4–74–71, *Hayes-Albion Corporation* v. *Samuel L. Cohn and Charles C. Cohn, doing business as Colonial Alloys Company.*

2,800,631, Suess, Trenkler, Hauttman and Rinesch, METHOD OF CARRYING OUT MELTING PROCESSES, **filed** Mar. 4, 1974, D.C. Del. (Wilmington), Doc. 74–35, *Kaiser Industries Corp. et al.* v. *Interlake, Inc.* **Same, filed** Mar. 4, 1974, D.C., N.D. Ind. (Hammond), Doc. 74–63, *Kaiser Industries Corp. et al.* v. *Youngstown Sheet & Tube Co.* **Same, filed** Mar. 4, 1974, D.C., W.D. Pa. (Pittsburgh), Doc. 74–214, *Kaiser Industries Corp., Vereinigte Oesterreichische Eisenund Stahl Werke-Alpine Montan Aktiengesellschaft and Brassert Oxygen Technik Co.* v. *Crucible Inc.* **Same, filed** Mar. 5, 1974, D.C., W.D. Pa. (Pittsburgh), Doc. 74–217, *Kaiser Industries Corporation, Vereinigte Oesterreichische Eisenund, Stahlwerke-Alpine Montan Aktiengesellschaft and Brassert Oxygen Technik AG* v. *Jones and Laughlin Steel Corp.*

2,841,686, E. M. Williams, AUTOMATIC CONTROL SYSTEM FOR THE ELECTRODE OF A SPARK-CUTTING APPARATUS: **2,979,739,** Williams and Porterfield, PILOT PULSE SPARK MACHINING METHODS AND APPARATUS; **3,018,411,** R. S. Webb, PER PULSE CUT-OFF CIRCUIT; **3,257,580,** same, FAULT DETECTION AND CUT-OFF CIRCUIT FOR ELECTRICAL DISCHARGE MACHINING APPARATUS: **3,548,142,** K. H. Sennowitz, GAP SHORT CIRCUIT CONTROL SYSTEM FOR ELECTRICAL DISCHARGE MACHINING APPARATUS; **3,767,886,** same, ELECTRICAL DISCHARGE MACHINING POWER SUPPLY WITH PROTECTIVE SYSTEM FOR OUTPUT SWITCH FAILURE: **Re. 24,733,** J. V. Erwin, DRUM HEAD AND LIKE ASSEMBLIES, **filed** Feb. 7, 1974, D.C., E.D. Mich. (Detroit), Doc. 4–71092, *Colt Industries Operating Corp. (Elox Division)* v. *Easco-Sparacatron, Inc. and Hayes Engineers (Leeds) Ltd.*

2,875,282, E. M. Reiback, BINAURAL PHONOGRAPH PICKUP, **filed** Feb. 26, 1973, D.C., N.D. Ohio (Cleveland), Doc. C–73–213, *Empire Scientific Corp.* v. *Audio-Technica U.S. Inc.* Stipulation and order dismissing action with prejudice, Mar. 7, 1974.

2,919,200, Dubin and White, BACTERIOSTATIC PLASTIC, **filed** Apr. 11, 1973, D.C., E.D. Mo. (St. Louis), Doc. 73C214 (1), *Maurice T. Dubin and James M. White* v. *Owens-Corning Fiberglas Corp. and Schnarr's True Value.* Case dismissed with prejudice, Feb. 6, 1974.

2,979,639. (See 2,841,686.)

2,984,032, F. S. Cornell, ARTIFICIAL FIREPLACE APPARATUS, **filed** Feb. 25, 1974, D.C. Conn. (Bridgeport), Doc. B–74–60, *Rustic Crafts Co., Inc.* v. *Brickote, Inc.*

3,018,411. (See 2,841,686.)

3,144,085, M. M. Hasha, POWER SPINNER UNIT FOR WELL SWIVELS, **filed** Mar. 1, 1974, D.C., W.D. La. (Shreveport), Doc. 74–225–L, *Malvern M. Hasha and International Tool Co., Inc.* v. *The Red Fox Machine & Supply Company.*

3,158,317, I. H. Alexander, CONTROL DEVICE; **3,187,321,** S. L. Kameny, OPERATION COMPUTER COMMUNICATION CONSOLE; **3,226,689,** Amdahl, Brian, Jr., Scarbrough and Schneberger: **3,226,692,** Fuller, Koerner and Schneberger, MODULAR COMPUTER SYSTEM; **3,258,748,** Schneberger, Scarbrough, Bienhoff and Connolly, STORED LOGIC COMPUTER: **3,275,991,** E. J. Schneberger, MEMORY SYSTEM; **3,341,817,** J. C. Smeltzer, MEMORY TRANSFER APPARATUS, **filed** Mar. 1, 1974. D.C., N.D. Ill. (Chicago), Doc. 74c580, *Bunker Ramo Corporation* v. *International Business Machines Corporation.*

3,187,321. (See 3,158,317.)

3,226,689. (See 3,158,317.)

3,257,580. (See 2,841,686.)

3,258,748. (See 3,158,317.)

3,275,991. (See 3,158,317.)

3,336,546, V. E. DeLucia, VACUUM RELAY FOR RADIO FREQUENCY SIGNALS, **filed** Nov. 29, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–2778–WMB, *Torr Laboratories, Inc.* v. *Kilovac Corporation.* Filed consent judgment and order that claims 1, 2, and 3 of plaintiff's patent are declared invalid, plaintiff's complaint for infringement of claims 4, 5, 6 and 7 is dismissed with prejudice. Plaintiff's complaint for infringement of claims 1–4 is dismissed with prejudice. Defendant's counterclaim is dismissed without prejudice, entered Feb. 28, 1974.

3,341,817. (See 3,158,317.)

3,351,148, S. M. Solomon, SELF-OPERABLE DETACHABLE POWER UNIT ATTACHMENT FOR WHEEL CHAIRS AND POWER CONTROL UNIT THEREFOR; **3,720,281,** J. B. Mandle, APPARATUS FOR MEASURING AND DIGITALLY INDICATING LINER DISPLACEMENT BETWEEN TWO RELATIVELY MOVABLE MEMBERS, **filed** May 25, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–1185–HP, *Hewson Control Devices, Inc.* v. *James E. Lease et al.* Filed order of dismissal without prejudice to reopen the action if settlement is not consummated within 120 days, entered Mar. 1, 1974.

3,368,280, Friedman and Richman, DENTAL TOOL; **3,375,583,** Blank and Richman, ULTRASONIC DENTAL TOOL, **filed** Feb. 28, 1974, D.C., W.D.N.Y. (Buffalo), Doc. C–74–99, *Litton Medical Products, Inc.* v. *Sybron Corporation.*

3,375,583. (See 3,368,280.)

3,402,657, Potter, Foley and Antonucci, HIGH SPEED BELT PRINTER WITH PRINTING SLUG SUPPORTING MEANS; **Re. 26,240,** C. I. Wasserman, HIGH SPEED PRINTERS WITH COLUMN SPANNING HAMMERS, **filed** Mar. 8, 1974, Ct. of Appeals, First Circuit, Mass. (Boston), Doc. 74–1081, *Potter Instrument Company, Inc.* v. *Odec Computer Systems, Inc.*

3,443,459, Mackey and Mackey, DRILL; **3,521,405,** Mackey, Jr. and Naureckas, DRILL GRINDING APPARATUS; **3,592,555,** B. A. Mackey, Sr., DRILL WITH DISCONTINUOUS CUTTING LIPS; **3,656,264,** Mackey, Jr. and Naureckas, METHOD OF GRINDING DRILLS, **filed** Feb. 25, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c521, *International Carbide Corporation et al.* v. *Donald H. Geiger.*

3,501,861, Goldfarb and Soriano, GAME APPARATUS AND TIME-DELAY ACTION UNIT; **3,526,991,** same, DELAY ACTION PLAY UNIT, **filed** Mar. 4, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–554–WMB, *Imperial Toy Corp.* v. *A. Eddy Goldfarb & Associates and Ideal Toy Corp.*

3,521,405. (See 3,443,459.)

3,526,991. (See 3,501,861.)

3,548,142. (See 2,841,686.)

3,583,340, Dahl and Robier, PATTERN MEANS, PATTERN-FOLLOWING MEANS, AND SERVO MEANS CONTROLLED THEREBY, **filed** Feb. 21, 1974, D.C., C.D. Calif. (Los Angeles), Doc. 74–473–R, *Frank L. Dahl* v. *Kirsch Co. et al.*

3,592,555. (See 3,443,459.)

3,622,029, G. K. Ware, ELECTRICAL OUTLET BOX, **filed** June 6, 1972, D.C., N.D. Ind. (South Bend), Doc. 72–S–116, *Ware Fuse Corporation* v. *Southeastern Mobile Home and Supply.* Cause dismissed with prejudice by stipulation, Nov. 6, 1972.

3,644,051, A. H. Shapiro, TURBO-MOLECULAR AND STATOR PUMP HAVING IMPROVED ROTOR CONSTRUCTION, **filed** Mar. 8, 1974, D.C., W.D. Pa. (Pittsburgh), Doc. 74–233, *Sargent-Welch Scientific Company* v. *Leybold-Heraeus GmbH & Co., KG and Leybold-Heraeus Inc.*

3,656,264. (See 3,443,459.)

3,665,318, S. J. Hoffman, RADIO RECEIVER; **3,714,585,** R. C. Koch, SCANNING RADIO HAVING RAPID CHANNEL SKIPPING CAPABILITY, **filed** Apr. 6, 1973, D.C., E.D. Mich. (Detroit), Doc. 39931, *Regency Electronics, Inc.* v. *Crandall Wholesale Company.*

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE, **filed** Mar. 7, 1974, D.C.N.C. (Statesville), Doc. ST.–C–74–6, *Tights, Inc.* v. *Ridgeview Hosiery Mill Company.*

3,714,585. (See 3,665,318.)

3,720,281. (See 3,351,148.)

3,724,696, C. G. Leeper, TRUSS TRANSPORTING BODY, **filed** Jan. 3, 1974; D.C., E.D. Tenn. (Greenville), Doc. C–2–74–2, *Charles G. Leeper* v. *Kilby & Wine Inc.* Order of dismissal filed. Cause has been compromised and settled, Mar. 7, 1974.

3,766,460, Hentz and Burroughs, MANUAL CONTROL SYSTEM FOR NUMERICALLY CONTROLLED MACHINE, **filed** Feb. 26, 1974, D.C.N.J. (Newark), Doc. C–74–262, *H.E.S. Machine Tool, Inc.* v. *Le Blond, Inc.*

3,767,886. (See 2,841,686.)

Re. 24,733. (See 2,841,686.)

Re. 26,240. (See 3,402,657.)

D. 227,722, M. A. Mendlin, COMBINED BED AND STORAGE UNIT; **D. 227,723,** same; **D. 227,724,** same; **D. 227,725,** same, **filed** Feb. 25, 1974, D.C.N.J. (Trenton), Doc. C–74–257, *Bunk Trunk Distributors* v. *Janus Corp.*

D. 227,723. (See D. 227,722.)

D. 227,724. (See D. 227,722.)

D. 227,725. (See D. 227,722.)

Plant Pat. 1,550, W. A. Law, APPLE TREE; **Plant Pat. 1,565,** R. A. Bisbee, same, **filed** Mar. 1, 1974, D.C., M.D. Pa. (Scranton), Doc. C–74–184, *Stark Brothers Nurseries and Orchards Company* v. *Adams County Nursery and Fruit Farms.*

Plant Pat. 1,565. (See Plant Pat. 1,550.)

Erratum

In the OFFICIAL GAZETTE of Mar. 12, 1974, volume 920, page 286, the entire paragraph beginning with "3,738,836" should be deleted.

Certificates of Correction for the Week of Aug. 27, 1974

Re. 27,826	3,750,088	3,765,049	3,789,187
Re. 27,951	3,750,848	3,765,393	3,789,983
3,617,188	3,751,281	3,765,750	3,795,931
3,646,049	3,751,637	3,765,974	3,797,566
3,652,556	3,752,407	3,766,408	3,797,713
3,654,620	3,752,798	3,766,771	3,798,376
3,677,364	3,752,826	3,767,208	3,798,509
3,712,804	3,753,998	3,767,323	3,799,903
3,713,098	3,755,656	3,767,960	3,800,338
3,718,694	3,756,533	3,768,036	3,802,261
3,721,201	3,757,103	3,768,989	3,802,431
3,734,801	3,759,126	3,770,731	3,803,333
3,736,132	3,759,862	3,770,749	3,803,631
3,737,534	3,760,139	3,770,998	3,803,640
3,738,985	3,761,144	3,771,020	3,803,765
3,739,383	3,761,273	3,772,507	3,805,790
3,740,307	3,761,595	3,775,118	3,806,941
3,741,593	3,762,231	3,775,410	3,807,042
3,743,335	3,763,047	3,777,743	3,807,204
3,744,363	3,763,447	3,778,413	3,807,274
3,744,726	3,763,475	3,778,450	3,807,319
3,745,611	3,764,125	3,780,985	3,807,431
3,746,874	3,764,181	3,782,941	3,807,603
3,748,149	3,764,417	3,783,771	3,807,728
3,748,373	3,764,615	3,784,654	3,807,907
3,748,394	3,764,738	3,785,255	3,807,993
3,748,593	3,764,803	3,785,861	3,808,535
3,748,756	3,764,975	3,787,535	

Dedications

3,412,903.—*William P. Van Riper, Jr.* and *Thomas A. Stevens*, Cincinnati, Ohio. APPARATUS FOR HEATING AND DISPENSING VISCOUS MATERIALS. Patent dated Nov. 26, 1968. Dedication filed Jan. 17, 1974, by the assignee *Inmont Corporation*.

Hereby dedicates to the Public the entire remaining term of said patent.

3,486,192.—*Gene Le Roy*, Charleston, W. Va. APPARATUS FOR EXTRUSION OF THERMOPLASTICS. Patent dated Dec. 30, 1969. Dedication filed Mar. 13, 1974, by the assignee *Union Carbide Corporation*.

Hereby dedicates to the Public the remaining term of said patent.

3,620,943.—*John D. White*, Little Falls, N.J. BLACK ANTI-FOULING COATING COMPOSITIONS. Patent dated Nov. 16, 1971. Dedication filed May 6, 1974, by the assignee, *Celanese Coatings Company*.

Hereby dedicates to the Public the remaining term of said patent.

3,695,643.—*John D. Schmunk*, Findlay, Ohio. CORRUGATED TUBE COUPLING MEANS. Patent dated Oct 3, 1972. Dedication filed May 23, 1974, by the assignee, *The Hancock Brick & Tile Company*.

Hereby dedicates to the Public the entire remaining term of said patent.

Disclaimers

3,445,295.—*Holley R. Smith*, North Wales, and *Bernard P. Sykes*, West Chester, Pa. AMMONIA BATTERY. Patent dated May 20, 1969. Disclaimer filed May 24, 1974, by the assignee, *Honeywell Inc.*

Hereby enters this disclaimer to claims 1 through 5 of said patent.

3,502,408.—*Ivor Brodie*, Palo Alto, Calif. ELECTROPHOTOGRAPHY EMPLOYING A FILM HAVING A THIN CHARGE RETENTIVE COATING ON A CONDUCTIVE WEB. Patent dated Mar. 24, 1970. Disclaimer filed Feb. 11, 1974, by the assignee, *Varian Associates*.

Hereby enters this disclaimer to all claims of said patent.

3,504,971.—*Ellsworth Jacob McCune*, Webster, N.Y. EXPOSURE CONTROL FOR COLOR PRINTERS. Patent dated Apr. 7, 1970. Disclaimer filed Jan. 31, 1974, by the assignee, *Eastman Kodak Company*.

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3,524,067.—*Donald Lee West*, Lexington, Ky. COMPACT LINE GRATING POSITION SENSING DEVICE. Patent dated Aug. 11, 1970. Disclaimer filed Jan. 17,. 1974, by the assignee, *International Business Machines Corporation*.

Hereby enters this disclaimer to claim 1 of said patent.

3,553,251.—*Hartmut Hauth*, Riehen, and *Dietrich Stauffacher*, Reinach, Basel, Switzerland. ALICYCLIC COMPOUNDS. Patent dated Jan. 5, 1971. Disclaimer filed Oct. 10, 1973, by the assignee, *Sandoz Ltd. (also known as Sandoz A.G.)*.

Hereby enters this disclaimer to claims 27, 28, 29 and 47 of said patent.

3,570,748.—*James Warren Coyle*, Montville, N.J. and *Louis John Marsella*, Leominster, Mass. COMPOSITE FILM AND METHOD. Patent dated Mar. 16, 1971. Disclaimer filed Jan. 28, 1974, by the assignee, *Standard Packaging Corporation*.

Hereby enters this disclaimer to claims 1–42 of said patent.

3,588,998.—*Vincent A. Corsaro*, Haverhill, Mass. METHOD FOR TREATING ARTICLES WITH A LIQUID. Patent dated June 29, 1971. Disclaimer filed Feb. 22, 1974, by the assignee, *Western Electric Company, Incorporated*.

Hereby enters this disclaimer to all claims of said patent.

3,616,708.—*Charles S. Davis*, New York, N.Y. ROTARY POWER TRANSMISSION ASSEMBLY. Patent dated Nov. 2, 1971. Disclaimer filed June 24, 1974, by the assignee, *Curtiss-Wright Corporation*.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,643,142.—*Lyle E. McBride, Jr.*, Norton, Mass. A.C. MOTOR CONTROL SYSTEM UTILIZING A SELECTIVELY ENERGIZABLE SEMICONDUCTOR SWITCH MEANS. Patent dated Feb. 15, 1972. Disclaimer filed Feb. 25, 1974, by the assignee, *Texas Instruments Incorporated*.

Hereby enters this disclaimer to claims 1 and 9 of said patent.

3,647,433.—*Lawrence Edward Contois*, Webster, N.Y. DINITROARYLMETHINE DYES AS SENSITIZERS IN ELECTROPHOTOGRAPHIC LAYERS. Patent dated Mar. 7, 1972. Disclaimer filed Feb. 13, 1974, by the assignee, *Eastman Kodak Company*.

Hereby enters this disclaimer to all claims of said patent.

3,654,254.—*Brian Ernest Job, Alexander Joseph Peter Pioli*, and *Till Medinger*, Runcorn, England. POLYMERISATION PROCESS. Patent dated Apr. 4, 1972. Disclaimer filed May 6, 1974, by the assignee, *Imperial Chemical Industries Limited*.

Hereby enters this disclaimer to claims 1–6, inclusive, of said patent.

3,656,266.—*Adolfo Tylius*, Washington, D.C. BUILDINGS. Patent dated Apr. 18, 1972. Disclaimer filed Feb 15, 1974, by the assignee, *Alvic Development Corporation*.

Hereby enters this disclaimer to claims 1, 4 and 5 of said patent.

3,682,981.—*Frank Lee Weisenborn*, Somerset, *Joseph Edward Dolfini*, North Brunswick, *Georges Gustav Bach*, Hightstown, and *Jack Bernstein*, New Brunswick, N.J. 2-AMINO-2-(1,4-CYCLOHEXADIENYL) ACETIC ACID. Patent dated Aug. 8, 1972. Disclaimer filed May 28, 1974, by the assignee, *E. R. Squibb & Sons, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,718,673.—*William Charles Ripka*, Wilmington, Del. PROCESS FOR THE PREPARATION OF 21-CHLORO-6,6,9-ALPHA-TRIFLUORO-11BETA, ALPHA, 17ALPHA-TRIHYDROXY - 1,4 - PREGNADIEN-3,20-DIONE 16,17-KETALS AND SELECTED INTERMEDIATES. Patent dated Feb. 27, 1973. Disclaimer filed Mar. 1, 1974, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby enters this disclaimer to claims 5 and 7 of said patent.

3,721,379.—*Vincent A. Corsaro*, Haverhill, Mass. APPARATUS FOR TREATING ARTICLES WITH A LIQUID. Patent dated Mar. 20, 1973. Disclaimer filed Feb. 22, 1974, by the assignee, *Western Electric Company, Incorporated.*

Hereby enters this disclaimer to all claims of said patent.

3,802,661.—*Wilbur R. Leopold, Jr.*, Decatur, and *William L. Hauffe*, Warrensburg, Ill. ROTARY VALVE WITH ANTI-CORROSION AND TORQUE CONTROLLING MEANS. Patent dated Apr. 9, 1974. Disclaimer filed Apr. 25, 1974, by the assignee, *Mueller Co.*

Hereby disclaims the portion of the term of the patent subsequent to Mar. 26, 1991.

Disclaimers and Dedications

3,619,970.—*Seymour Zelnick*, Orange, N.J. AUTOMATIC METHOD AND APPARATUS FOR THE WRAPPING OF ARTICLES. Patent dated Nov. 16, 1971. Disclaimer and dedication filed Apr. 24, 1974, by the assignee, *Weldotron Corporation.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

3,782,454.—*Raymond S. Slaasted* and *Edward D. Smith*, Racine, Wis. HEAT EXCHANGER. Patent dated Jan. 1, 1974. Dedication filed Apr. 26, 1974, by the assignee, *Modine Manufacturing Company.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 3, 1974

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds: Inorganic Compositions: Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	9-25-73
GENERAL ORGANIC CHEMISTRY, GROUP 120—R. F. BURNETT, Acting Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids, Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-1-73
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-16-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-17-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-15-73
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-26-73
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-1-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-1-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-27-73
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy: Measuring.	12-10-73
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-26-73
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-3-74
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	10-29-73
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	11-2-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-26-73
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-20-73

Expiration of patents: The patents within the range of numbers indicated below expire during August 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,801,414 to 2,804,619, inclusive
Plant Patents..... Numbers 1,626 to 1,637, inclusive

REISSUES

AUGUST 27, 1974

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,132

CIRCUIT ARRANGEMENT INCLUDING A COLOUR DISPLAY CATHODE-RAY TUBE OF THE INDEX TYPE

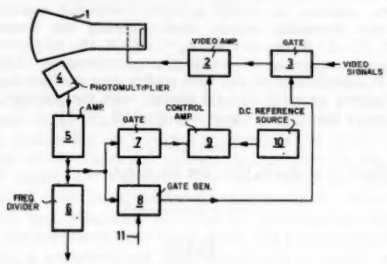
Kenneth George Freeman, Reigate, and Michael Compton French, Great Bookham, England, assignors to U.S. Philips Corporation, New York, N.Y.

Original No. 3,562,409, dated Feb. 9, 1971, Ser. No. 736,712, June 13, 1968. Application for reissue Feb. 5, 1973, Ser. No. 329,550

Claims priority, application Great Britain, June 16, 1967, 27,918/67

Int. Cl. H04n *5/68, 9/16*

U.S. Cl. 178—5.4 F **10 Claims**



A circuit for ensuring the minimum level flow of current in an indexing type color cathode ray display tube in order to prevent loss of the indexing signal during a scanning period. A gate is provided to prevent application of video signals to the display tube during the first few lines of each field, and during this time a control signal is produced from the indexing signal corresponding to the desired black level. The control signal thus produced is applied to the display tube for the remainder of the field.

28,133

METHOD OF WINDING A BALL

Rudolph G. Holman, Santa Ana, Calif., assignor to AMF, Inc., Jersey City, N.J.

Original No. 3,136,492, dated June 9, 1964, Ser. No. 142,272, Oct. 2, 1961, which is a division of application Ser. No. 635,514, Jan. 22, 1957, now Patent No. 3,071,331, which in turn is a continuation-in-part of abandoned application Ser. No. 513,280, June 6, 1955. Application for reissue Nov. 12, 1973, Ser. No. 414,985

Int. Cl. B65h *54/66*

U.S. Cl. 242—3 **12 Claims**

A method of winding a reinforcing strand on the surface of a spherical body by synchronously rotating the body about two axes so that a series of successive turns approximate angularly spaced great circles which intersect at diametrically positioned polar regions, the rotation about one axis being periodically interrupted for a fraction of a revolution of the body about its other axis to displace the polar regions of the succeeding series of turns

from the locations of the polar regions of the preceding series of turns.

28,134

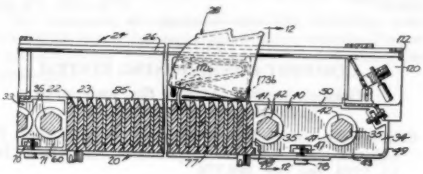
CORDLESS ELECTRIC CROSS-CONNECT PANEL WITH IMPROVED MOVABLE CONTACT ASSEMBLY

Ariel R. Davis, 3476 Fleetwood Drive, Salt Lake City, Utah 84109

Original No. 3,603,747, dated Sept. 7, 1971, Ser. No. 883,099, Dec. 8, 1969, which is a continuation-in-part of abandoned application Ser. No. 660,988, Aug. 16, 1967. Application for reissue Aug. 7, 1972, Ser. No. 278,437

Int. Cl. H01h *9/00, 15/00;* **H02b** *1/04*

U.S. Cl. 200—1 R **28 Claims**



A cross-connect or patch panel has a multiplicity of long bus bars interleaved with insulating strips and parallel side support beams. Transverse members hold the bus bars, insulating strips and beams together. Cross-connect modules are mounted on the support beams to span the bus bars and strips and to slidably carry contact assemblies for engagement with a selected bus bar. The contact assemblies are actuatable between bus bar contacting and disengaging positions.

28,135

SOLID SMOOTH-SURFACE ARTICLE WASHING DEVICE

Charles Amory Hull, Daytona Beach, Fla. (58 Brook Drive, Ormond Beach, Fla. 32074)

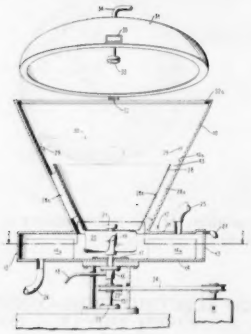
Original No. 3,514,329, dated May 26, 1970, Ser. No. 716,549, Mar. 27, 1968. Application for reissue May 22, 1972, Ser. No. 255,870

Int. Cl. B08b *3/00*

U.S. Cl. 134—58 D **7 Claims**

A solid smooth-surface article washing device comprising a flat top wash fluid reservoir with two inverted

frusto-conical casings mounted one inside the other on the top surface of the reservoir. A wash fluid impeller is arranged within the reservoir with the body thereof substantially below the liquid level of the wash fluid therein and in vertical alignment with the relatively narrow end of the inner casing. The article to be washed is suspended above the relatively wide end of the inner



casing. When activated, the impeller moves the wash fluid upwardly within the inner casing in a spiraling rotary pattern to flow outwardly over the surface of the article being washed. On leaving the peripheral edge of the article being washed, the fluid continues to move outwardly until it contacts the inner side wall of the outer casing whereupon it drains back into the fluid reservoir through a chamber formed between the casings.

28,136

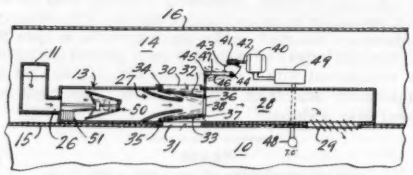
COMFORT CONDITIONING SYSTEM

Gershon Meckler, Atlanta, Ga., assignor to National Service Industries, Inc.

Original No. 3,390,720, dated July 2, 1968, Ser. No. 563,228, July 6, 1966. Application for reissue June 11, 1973, Ser. No. 368,776

Int. Cl. F25b *27/00*

U.S. Cl. 165—39 **15 Claims**



For supplying conditioned air to a room, a system having a box for mixing conditioned air with either room air or heated air from a plenum, or both. The mixing box, which is mounted flush in a dropped ceiling, has two opposed openings in its surfaces; one opening leads to the room and the other leads to the plenum. Two spaced apart faces are pivotally mounted over the openings such that at extreme positions one of the openings is covered and the other is uncovered and at intermediate positions both openings are uncovered in varying degrees. Conditioned air passes through a nozzle to increase its velocity, mixes with secondary air from the uncovered openings, and enters the room. Room temperature is regulated by a controlled motor which operates the two pivotally mounted faces.

28,137

OLEFIN PREPARATION

Leonard Turner, Woking, Christopher Patrick Cadman Bradshaw, Sunbury-on-Thames, and Eric James Howman, Crowthorne, England, by The British Petroleum Company Limited, London, England, assignee

No Drawing. Original No. 3,526,676, dated Sept. 1, 1970, Ser. No. 507,675, Nov. 15, 1965. Application for reissue Mar. 1, 1972, Ser. No. 231,035

Claims priority, application Great Britain, Nov. 19, 1964, 47,053/64

Int. Cl. C07c *3/62, 15/10*

U.S. Cl. 260—683 D **16 Claims**

A process for preparing olefins is provided which comprises reacting an initial mixture consisting essentially of two dissimilar acyclic olefins having the formulas $R(R_1)C{=}C(R_2)R_3$ and $R_4(R_5)C{=}C(R_6)R_7$ respectively, in the presence of an olefin disproportionation catalyst, the R substituents of the feed olefins representing hydrogen atoms or alkyl or aryl groups with the proviso that not more than two of the groupings $R(R_1)C<$,

$R_3(R)_2C<$,

$R_4(R_5)C<$ or $R_7(R_6)C<$ are the same.

28,138

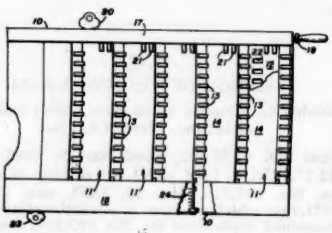
VOTING MACHINE WITH CARD PUNCH ATTACHMENT

Cothburn M. O'Neal, Arlington, Tex., assignor to Riverside Press, Inc., Dallas, Tex.

Original No. 3,524,969, dated Aug. 18, 1970, Ser. No. 740,415, May 27, 1968. Application for reissue June 16, 1972, Ser. No. 263,635

Int. Cl. G07c *13/00*

U.S. Cl. 235—54 R **11 Claims**



A compact, lightweight, manually operated voting machine with provisions for straight ticket, selective and write-in voting, and for choosing two or more candidates from a list of several running at large; with provision for recording each voter's choice on a punch card for computer counting, and including a mechanical counter automatically totalling the votes for each candidate for confirmation of the punch card count.

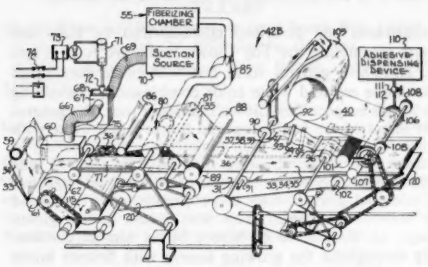
28,139
APPARATUS FOR SUCCESSIVELY FORMING DISPOSABLE DIAPERS

Graves T. Gore, Aiken, S.C., assignor to Riegel Textile Corporation, Ware Shoals, S.C.

Original No. 3,661,680, dated May 9, 1972, Ser. No. 17,594, Mar. 9, 1970. Application for reissue Nov. 30, 1972, Ser. No. 310,851

Int. Cl. B31f *7/00*

U.S. Cl. 156—467 **17 Claims**



An apparatus for successively forming disposable diapers including means for supplying an elongate moisture absorbent pad and for feeding it along a predetermined longitudinal path of travel, means for supplying and positioning an elongate fluid permeable front cover sheet in superimposed relation to one side of the pad and means for supplying and positioning an elongate backing sheet in superimposed relation to the other side of the pad. Means are provided for receiving and feeding the superimposed front cover sheet, pad and backing sheet along a predetermined longitudinal path of travel, while additional means cooperate therewith for longitudinally sealing the side portions of the superimposed components, for transversely sealing the superimposed components at predetermined longitudinally spaced intervals to form successively interconnected diapers and for severing the same along susccessive transverse seals to form individual diapers.

28,140
SEMICONDUCTOR EPITAXIAL GROWTH FROM SOLUTION

Arpad Albert Bergh, Murray Hill, Ralph Paola, Westfield, and Robert H. Saul, Scotch Plains, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,690,965, dated Sept. 12, 1972, Ser. No. 202,837, Nov. 29, 1971. Application for reissue Jan. 22, 1973, Ser. No. 325,637

Int. Cl. H01l *7/38*

U.S. Cl. 148—172 **16 Claims**

Crystalline layers of Group III–V semiconductor materials are grown epitaxially from solution by a method which includes the isolation of small equal portions of solution from a solution reservoir. The portions in contact with the crystal substrate are constrained in a direction perpendicular to the substrate to be less than 3 millimeters thick before crystal growth is initiated by lowering the temperature of the substrate and its contacting solution. At the termination of growth, the depleted solution is removed from the grown layer leaving a surface sufficiently perfect to allow further processing without an intervening grinding or polishing operation.

28,141
COMPOSITION CONTAINING 1-SUBSTITUTED-3-DI-SUBSTITUTED METHYLENE PYRROLIDINES AND METHODS OF TREATING DEPRESSION

Carl D. Lunsford, Richmond, Va., Grover C. Helsley, Pottersville, N.J., and John A. Richman, Jr., Silver Spring, Md., assignors to A. H. Robins Co., Incorporated, Richmond, Va.

No Drawing. Original No. 3,458,635, dated July 29, 1969, Ser. No. 570,717, Aug. 8, 1966. Application for reissue Apr. 12, 1973, Ser. No. 350,488

Int. Cl. A61k *27/00*

U.S. Cl. 424—274 **7 Claims**

The treatment of emotional and like disorders associated with depression and compositions *therefor* [therefore] comprising *1-substituted*-3-di-substituted methylene pyrrolidines.

PLANT PATENTS

GRANTED AUGUST 27, 1974

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,599
PEAR TREE

William H. Griggs, Davis, and Ben T. Iwakiri, Sacramento, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed June 4, 1973, Ser. No. 367,048
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—36 1 Claim

1. The new and distinct variety of pear tree herein described and illustrated and characterized by its medium to large size, rapid vigorous growth and speading shape; said tree coming into bloom one to three days earlier than Bartlett and being an early, regular and productive bearer of medium to large size fruit; said fruit becoming hard or picking ripe approximately the same time as Bartlett and colored a light green ground or under color in its shaded areas and a dark red over color dotted with conspicious green lenticels on its sun exposed areas when ripe; said undercolor becoming yellow and the over color changing to bright red speckled with yellow lenticels while the fruit is ripening; said fruit resembling the fruit of Comice in form, flavor, soluble solids content, season and storage life, but differing therefrom by its poignant aroma, freedom from russet, and highly attractive peach-like beauty imparted by its bright red exposed side contrasted with the glistening yellows of its shaded areas.

3,600
CARNATION PLANT

Louis Grasso, Lingostiere, Route de Grenoble, 06 Nice, France

Filed Apr. 24, 1973, Ser. No. 354,147
Claims priority, application France, Apr. 24, 1972, 95
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—70 1 Claim

1. The new and distinct variety of carnation plant as described and illustrated.

3,601
MINIATURE ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Apr. 23, 1973, Ser. No. 353,776
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—7 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, rounded, much branched, bush type, as illustrated and described characterized by buds and flowers resembling the Toy Clown miniature rose (Plant Pat. 2,909) in general form but with more petals and of a unique red and white color combination, resembling also in this respect Toy Clown miniature rose, the general color effect of the freshly opened flower being white with all petals edged red or deep pink (the colors tending to be more sharply contrasting than in Toy Clown) and further characterized by a plant of modest yet vigorous and compact growth, easy to propagate from hardwood and softwood cuttings, with small dark green glossy foliage, an abundance of bloom borne almost continuously throughout the growing season with flowers borne singly and in loose clusters.

3,602
CARNATION PLANT

Alexandre Barberet and Henri Blanc, La Londa, France, assignors to Laboratoire de Physiologie Vegetale de La Londe Barberet & Blanc, La Londe, France

Filed Mar. 30, 1973, Ser. No. 346,717
Claims priority, application Italy, Dec. 22, 1972, 33,459/72
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—72 1 Claim

A new variety of carnation plant suitable for greenhouse culture for the production of cut flowers, particularly distinguished by the more homogeneous size of its relatively large flowers, its very long floral stems, and the deeper pink coloring of its blooms.

3,603
PEACH TREE

Lewis B. Sherrill, Rte. 2, Box 536, Bakersfield, Calif. 93307

Filed July 12, 1973, Ser. No. 378,781
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—43 1 Claim

A peach tree of medium size, medium vigor, spreading growth, vase-form, hardy for California peach producing areas, abundantly foliated with large, uniform, lanceolate, deep-green leaves having a crenate margin and reniform glands, medium in blooming period with light pink showy flowers, and a regular and productive bearer of large, uniform, globose, freestone fruit having yellow skin substantially overspread with red, yellow flesh, and a red pit cavity with the red streaked into the flesh.

PATENTS

GRANTED AUGUST 27, 1974

GENERAL AND MECHANICAL

3,831,200
TECHNIQUE FOR ELIMINATING PILLING IN SHIRT COLLARS

George Weiss, 520 Magnola Blvd., Long Beach, N.Y. 11561

Filed Feb. 24, 1972, Ser. No. 229,114

Claims priority, application Great Britain, July 20, 1971, 33873/71

Int. Cl. A41b *3/00*

U.S. Cl. 2—143 1 Claim

To eliminate a condition in fabric which contributes to pilling thereof, a method of treatment which includes subjecting the fabric, while it is not restrained against contracting, to an elevated temperature at which the fabric does, in fact, contract and, in so doing, assumes a related condition which minimizes pilling of the fibers or yarns of said fabric.

3,831,201
CLIP FOR FORMING SIMULATED SLIPKNOT

Camille J. Burny, Jr., 820 Lathrop Ave., River Forest, Ill. 60305

Filed Mar. 1, 1973, Ser. No. 337,095

Claims priority, application Italy, Oct. 20, 1972, 30766/72

Int. Cl. A41d *25/02*

U.S. Cl. 2—150 2 Claims

A clip construction for simulating a slipknot in a necktie and of generally U-shaped configuration is provided which comprises an ornamental item of jewelry. The clip has opposed arms extending from a central curved portion and a central projection extending in the direction of the arms which projects into the interval between the arms.

3,831,202
HAIR IMPLANT AND PROCESS

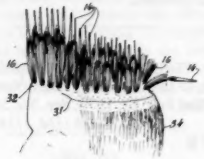
Wayne D. Hulsen, 15342 79th St., Howard Beach, N.Y. 11414

Filed Oct. 6, 1972, Ser. No. 295,546

Int. Cl. A61f *1/24*

U.S. Cl. 3—1 9 Claims

A base member, which may be a thin, flexible formed plastic sheet, is provided with a plurality of needles to each of which is attached a tuft of hair. In a surgical procedure, a section of a patient's scalp is lifted. The base is inserted on the scalp and the section of lifted scalp is replaced to cover the base. In replacing the section of scalp, the plurality of needles pierce the scalp section and project therefrom. Each needle may then be withdrawn from the base and scalp, pulling its tuft of hair through the needle hole. Each tuft of hair is knotted or otherwise sewn at its inner end so as to be secured from pulling entirely out of the plastic base and the scalp. When



each tuft has been pulled to the full extent of its permitted travel, the needle is snipped off leaving an area of hair secured within the scalp.

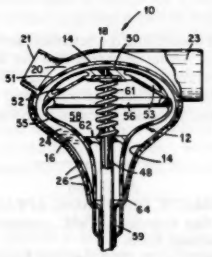
3,831,203
IMPLANTABLE BLOOD PUMPING SYSTEM

Malcolm G. Ridgway, Huntington Beach, Calif., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 28, 1973, Ser. No. 401,730

Int. Cl. A61f *1/24*

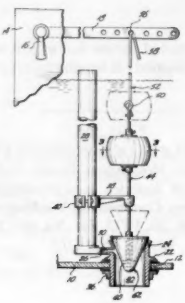
U.S. Cl. 3—1 10 Claims



A mechanically driven and automatically controlled artificial blood pump for replacement of a ventricle of a natural heart, including an expandable piston mounted within a flexible membrane but separated therefrom by means of a protective liquid. Both the membrane and piston are mounted within a housing having an upper chamber in which blood is pumped by the piston through actuation of the membrane from an inlet port to an outlet port and a lower chamber that is provided with perforations to expose the lower part of the membrane to body fluids that normally surround a heart and which are at ambient body pressure. A central part of the membrane is sealed to the housing to separate the upper and lower chambers. The piston is driven at a constant rate of reciprocation over a fixed-length stroke by means of an electric motor through a cylindrical groove cam. Since there is a natural change in venous pressure during diastole in response to bodily demands, there is a corresponding change in the pressure at the inlet valve of the blood pump and in the upper chamber. Automatic control is achieved by using a reciprocating drive of fixed rate and displacement in conjunction with a liquid reservoir referenced to ambient body tissue pressure which al-

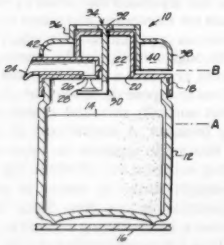
lows power assisted filling while precluding negative pressures at the inflow blood vessel. This particular arrangement ensures that the volume of blood admitted to the upper chamber during diastole is an accurate function of the blood demand of the body at all times, irrespective of the inflow valve impedance, since any differential space between maximum piston displacement and demanded blood volume is filled by the body fluids at ambient pressure. The pump can therefore be mechanically actuated by a relatively simple driving unit while automatically providing the required blood flow rate and maintaining diastolic pressure in the upper chamber very close to normal pressure.

3,831,204
TOILET FLUSH APPARATUS
John W. Cook, 1512 S. 11th St., Mount Vernon, Wash. 98273
Filed Feb. 28, 1973, Ser. No. 336,610
Int. Cl. E03d *1/34, 1/14*
U.S. Cl. 4—57 R **2 Claims**



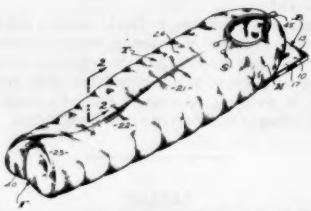
Apparatus for controlling the retention and selectively controlling the full or partial discharge of water from a toilet tank is disclosed wherein there is a non-buoyant valve cup associated with the usual discharge outlet seat and buoyancy is provided by a float adjustably located in spaced relation above said valve cup.

3,831,205
AUTOMATIC DISPENSING APPARATUS
Lary L. Foley, San Francisco, Calif., assignor to The Clorox Company, Oakland, Calif.
Filed Apr. 3, 1972, Ser. No. 240,530
Int. Cl. E03d *9/02*
U.S. Cl. 4—228 **9 Claims**



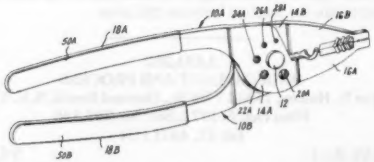
There is disclosed an automatic dispensing apparatus for dispensing a solution formed from a solid material into a process stream when the liquid level of the process stream drops below a pre-determined level. The apparatus is particularly adaptable to use in a toilet flush tank and comprises a float valve operative to dispense a metered amount of solution into the flush tank at the end of the flush cycle.

3,831,206
SLEEPING BAG
Riley R. Geary, 6202 No. Ivar, Temple City, Calif. 91780
Filed Dec. 17, 1973, Ser. No. 425,161
Int. Cl. A47g *9/00*
U.S. Cl. 5—343 **13 Claims**



A sleeping bag structure including a mattress-like base section with an upper head supporting portion and central body supporting portion and a lower leg supporting portion, a quilt-like cover section with an upper body covering portion, a central leg covering portion and a lower foot covering portion and dual connecting means releasably connecting adjacent edges of the section together to define a closed draft proof bag. Said connecting means including outer primary zipper type primary fastening means at and along related edges of the sections and inner secondary releasable fastening means between the adjacent edge portions of the sections inward of and parallel with the primary fastening means and holding said adjacent portions of the sections in draft and heat sealing engagement with each other. Said upper body portion of the cover section having a pair of laterally spaced extensions with interconnecting means at the free ends to define an upwardly and laterally extending arch supported on the head portion of the base section and defining a head accommodating hood.

3,831,207
MULTIPURPOSE PLIERS
Alfred Z. Boyajian, Manhattan Beach, Calif., assignor to The Stanley Works, New Britain, Conn.
Filed Dec. 18, 1970, Ser. No. 99,353
Int. Cl. B25b *7/22*
U.S. Cl. 7—5.5 **6 Claims**

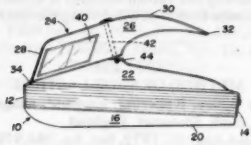


A multipurpose plier has pivotally connected operating members with apertures therein for shearing of bolts therebetween. Disposed at one end of the operating members are jaws with crimping, wire cutting, wire stripping, and gripping portions. The other ends of the operating members provide handles for operation thereof.

3,831,208
COMBINATION CAMPER AND BOAT

Erdis L. Smith, 110 Wesley Dr. N.W., Cedar Rapids, Iowa 52405

Filed Jan. 10, 1972, Ser. No. 216,585
Int. Cl. B63c *13/00*; B60f *3/00*; B60p *3/34*
U.S. Cl. 9—1 R 6 Claims

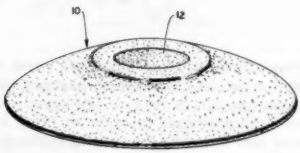


A compact self-contained unit which can be towed over the road and used as either a boat or a camper, the unit having complete living facilities. The unit has a hard top that can be raised to increase the head room when the unit is used either as a boat or as a camper, or the unit can be used with the top lowered as it normally is during transportation.

3,831,209
CONTAINER SUPPORT

David R. Clingman, 3202 Mathieson Dr., N.E., Atlanta, Ga. 30305

Filed Aug. 14, 1973, Ser. No. 388,106
Int. Cl. B63b *35/02*; A47g *29/00*
U.S. Cl. 9—1 A 3 Claims

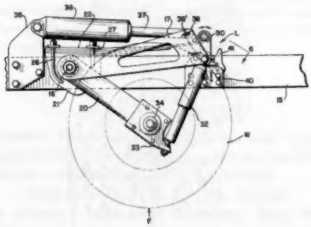


A buoyant beverage container support for retaining and supporting a beverage container in a vertical non-tilting and non-capsizing position on the surface of water. The beverage container comprises a piece of buoyant material of suitable size and shape containing a recessed portion therein for receiving the beverage container.

3,831,210
RETRACTABLE WHEEL ASSEMBLY

Gordon Y. W. Ow, 1604 Ihiloa Loop, Honolulu, Hawaii 96821

Filed Aug. 15, 1973, Ser. No. 388,492
Int. Cl. B63c *13/00*
U.S. Cl. 9—1 T 10 Claims

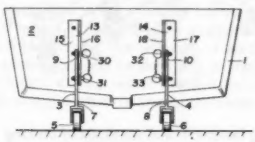


A wheel assembly to be mounted on a framework of a vehicle is disclosed wherein the action lever supporting the wheel is pivotally mounted on a fixed pivot, and adjacent to said pivot the base for one end of a leaf spring is integrally connected. The spring forms the main upper structural support of the assembly thereby simplifying the design and providing a controlled or tuned springing action for a smoother ride. The second end of the leaf spring is attached to a pivotal link that is supported on a pivot pin carried on a supplemental upper support arm, said arm extending generally parallel to the spring. The pivot pin is engaged by a latch to lock the wheel in the ground engaging or traveling position. The latch includes a pivotal yoke and cap latch element mounted on a single bracket on the framework. A reactive means, in the form of a shock absorber, is connected between the pivot pin and the free end of the action lever supporting the wheel. An actuating cylinder is provided to raise and lower the wheel assembly. The latch is automatically released by the initial movement of the actuating cylinder through a release finger when the wheel is retracted.

3,831,211
LIGHTWEIGHT BOAT MOVING DEVICE

Sebastian R. Bustamante, Carson, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,570
Int. Cl. B60p *3/10*; B62b *1/10*
U.S. Cl. 9—1 T 2 Claims

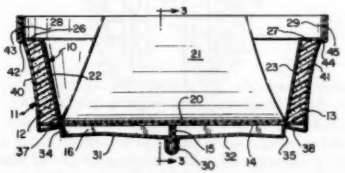


A lightweight boat moving device for a boat having a substantially planar stern comprises a pair of legs each having a wheel rotatably mounted at one end thereof. Fastening devices affixed to the stern of the boat secure the legs in spaced parallel relation in a first position in which the legs extend below the stern of the boat in a manner whereby the wheels are a predetermined distance below the bottom of the boat and a selected second position in which the legs extend above the stern of the boat in a manner whereby the wheels are a predetermined distance above the stern of the boat.

3,831,212
DOUBLE-HULLED BOATS

Richard L. Moore; Vaughn Moore, and Warren N. Moore, all of Highway 80, East Bossier City, La. 71010

Filed Aug. 3, 1973, Ser. No. 385,272
Int. Cl. B63b *5/24*
U.S. Cl. 9—6 2 Claims



A double-hulled boat with flotation material is disclosed. An inner hull constitutes a complete floatable shell and has integrally formed bottom, side and end walls with a flange extending laterally outwardly at the upper edges of the side walls. The outer hull is similarly integrally formed and has a bottom, side and end walls, the side walls having a flange of

smaller lateral dimensions than the inner hull so that the flanges are nestably mating and can be bonded together to define a flotation material-containing cavity therebetween. In the method of the invention the flotation material is sprayed on the exterior side walls of the inner hull before assembly. The inner and outer hulls are made of fiberglass. A plywood inner floor is sandwiched between the bottoms of the inner and outer hulls with a keel and skeletal rib structure disposed beneath the inner floor. The bottom of the outer hull is shaped to receive and retain the keel and rib structure. The keel, rib structure, inner floor and bottom portions of the two hulls are bonded and cured together as are the flanges to form a watertight, buoyant and durable structure.

3,831,213

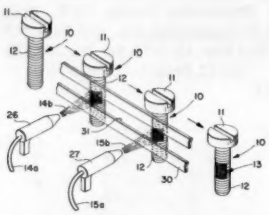
COMPOSITE SELF-LOCKING FASTENER

Ram D. Bedi, 3011 Pleasant Trl., Southfield, Mich. 48076

Continuation of Ser. No. 121,644, March 8, 1971. This application Sept. 7, 1972, Ser. No. 287,206

Int. Cl. B23g *9/00*

U.S. Cl. 10—10 P **9 Claims**



Self-locking fasteners, and methods of making same; for example, metal fasteners wherein the self-locking characteristic is derived from a composite patch comprising metals or metal alloys selectively bonded to the surface of the metal fastener by multiple molten spraying operations.

3,831,214

THREAD CUTTING APPARATUS

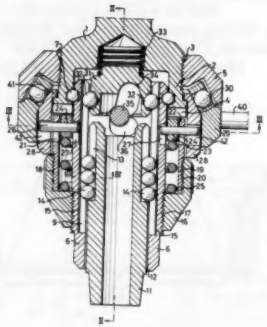
Uno Allan Alfredeen, Osmo, Sweden, assignor to Scandinavian Paper Converting AB, Osmo, Sweden

Filed Mar. 21, 1973, Ser. No. 343,530

Claims priority, application Sweden, Mar. 29, 1972, 4083/72

Int. Cl. B23g *3/00*

U.S. Cl. 10—89 H **8 Claims**



A thread cutting apparatus includes a driving member, a driven member, connecting means driving the driven member in one direction and having a bolt which is movable axially and is rotatable relatively to the driving member, and a sleeve carrying the driven member and extending axially to the driving member, the bolt engaging by spring action in a recess provided in the driving member and extending to L-shaped slots provided in the sleeve. When a resistance of the driven member is exceeded, the bolt is forced out of the recess, so that it is disengaged from the driving member, thus disengaging the driving member from the driven member. The bolt is also adapted to engage a bearing connected with the driven member and having a roller path. A bearing ring has a second roller path, whereby the driven member is caused to rotate in a direction opposite to that of the driving member.

3,831,215

METHOD OF SHOE LASTING

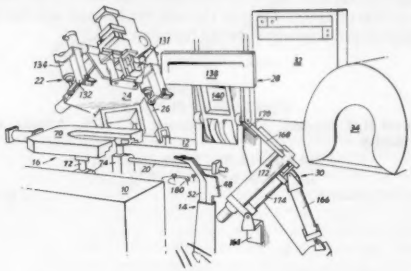
Frank Gordon Bailey, Kettering, England, assignor to C.I.C. Ralphs Ltd., Bath, Somerset, England

Filed Aug. 30, 1972, Ser. No. 284,970

Claims priority, application Great Britain, Sept. 21, 1972, 41100/72

Int. Cl. A43d *29/00*

U.S. Cl. 12—145 **5 Claims**



In the lasting of a fore part of a shoe, an upper is loosely disposed about a last, and the upper is clamped against the periphery of the sole part of the last. The upper is then subjected to mechanical stresses in order to bring it into its required shape, and following the shaping of the upper, the lasting margin is turned over and secured to the insole.

3,831,216

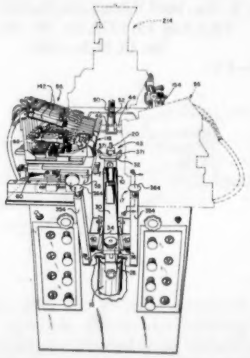
METHOD AND MACHINE FOR CEMENT LASTING

Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Aug. 6, 1973, Ser. No. 386,129

Int. Cl. A43d *21/00*

U.S. Cl. 12—145 **14 Claims**



A lasting machine that applies cement into the corner between a portion of the margin of an upper mounted on a last

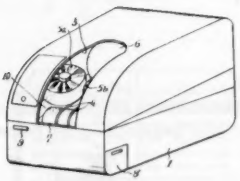
and an insole located on the last bottom and that wipes the margin portion against the insole so as to cementatiously attach the wiped margin portion to the insole.

3,831,217

AUTOMATIC SHOE POLISHING MACHINE

Tsugumu Odawara, Hiroshima-ken, Japan, assignor to Fuji Kikai Kogyo Kabushiki Kaisha, Hiroshima-ken, Japan

Filed Feb. 16, 1973, Ser. No. 333,226
Claims priority, application Japan, Apr. 18, 1972, 47-45007
Int. Cl. A47l *23/02*
U.S. Cl. 15—34 **1 Claim**



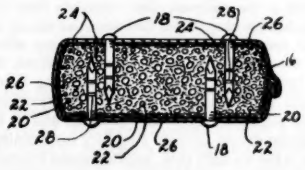
An automatic shoe polishing machine with a housing having an end opening for the insertion of a shoe to be polished by a pair of side brushes and a horizontal brush positioned at the corners of an isoceles triangle and driven on flexible shafts, a driven sand removing brush below said side brushes and a slideable plate below said side and front brushes for supporting said shoe and operating a switch for the drive for said brushes.

3,831,218

BRUSH CONSTRUCTION

Ronald Kaplan, 104 Fairway Ave., Verona, N.J. 07044

Filed Feb. 27, 1973, Ser. No. 336,184
Int. Cl. A46b *3/02*
U.S. Cl. 15—192 **6 Claims**



An improved brush construction wherein the bristled head is secured to the handle by means of a band and fastening means inserted therethrough, the improvement comprising a handle being prepared from a foamed fiber reinforced thermoplastic resin.

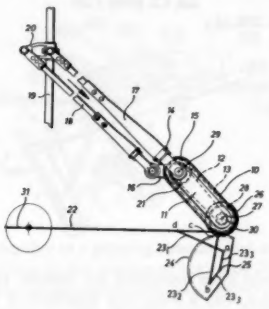
3,831,219

WINDSCREEN WIPER

Hans-Christian Deutscher, Ludwigsburg, and Kurt Bauer, Kleiningersheim, both of Germany, assignors to SWF Spezialfabrik Fur Autozubehor Gustav Rau GmbH

Filed June 29, 1972, Ser. No. 267,606
Claims priority, application Germany, June 30, 1971, 2132496
Int. Cl. A47l *1/00*; **B60s** *1/02*
U.S. Cl. 15—250.21 **5 Claims**

A windscreen wiper for obtaining a rectangular wiping area, comprising a wiper blade, a wiper arm, a guide arm and an oscillatory drive, the wiper blade being rotatably connected to one end of the wiper arm and being mounted, by means of a pivot member, on one end of the guide arm, wherein an axle is non-rotatably connected to a pivot arm, a double bearing being provided on the free end of the pivot arm, the wiper arm being non-rotatably connected to one part of the double bearing and the guide arm being rotatably connected to an intermediate lever which is non-rotatably connected to the other part of the double bearing, the two parts of the double bearing being driveable by separate toothed belt or chain drives, each drive comprising a driving wheel which is located concentrically with the axle but is non-rotatable therewith.

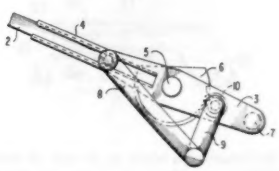


3,831,220

WINDSHIELD WIPER SYSTEM FOR VEHICLES

Gunter Gmeiner; Erwin Kolle, both of Sindelfingen, and Rudolf Binder, Schonaich, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgurt, Germany

Filed Mar. 28, 1973, Ser. No. 345,495
Claims priority, application Germany, Mar. 29, 1972, 2215307
Int. Cl. B60s *1/26*
U.S. Cl. 15—250.21 **5 Claims**



A windshield wiper installation for vehicles, especially for motor vehicles, with a wiper arm adjustable in its effective length which is supported displaceable in its longitudinal axis within a guide member adapted to be set into to and fro pivot movement by the wiper motor; the guide member is rotatably connected with the vehicle while a toothed segment coaxial with the pivotal connection of the guide member is rigidly connected with the vehicle; two levers are thereby provided which are pivotally connected with each other at one end while the free end of one lever is pivotally secured at the wiper arm and the free end of the other lever is pivotally secured at the guide member and carries a pinion non-rotatably secured thereto which meshes with the toothed segment.

3,831,221

WINDSHIELD WIPER INSTALLATION FOR VEHICLES

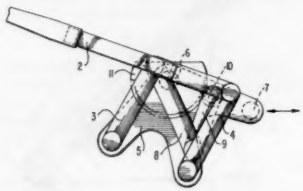
Gunter Gmeiner; Erwin Kolle, both of Sindelfingen, and Rudolf Binder, Schonaich, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Mar. 28, 1973, Ser. No. 345,496

Claims priority, application Germany, Mar. 29, 1972, 2215335

Int. Cl. B60s 1/26

U.S. Cl. 15—250.21 7 Claims



A windshield wiper installation for vehicles, especially for motor vehicles, with a wiper arm adjustable in its effective length which is connected with a control plate pivotally secured at the vehicle by way of two levers forming a link quadrangle while the control plate is adapted to be set into to and fro pivot movements about its pivot axis by the wiper motor; two further levers are provided which are pivotally connected with each other for the control of the effective length of the wiper arm whereby the free end of one lever is pivotally secured at the wiper arm and the free end of the other lever is pivotally secured at the control plate; the free end of the other lever at the same time carries a pinion non-rotatably secured thereto which meshes with a toothed segment non-rotatably secured at the vehicle and coaxial with the control plate.

3,831,222

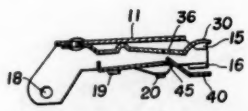
MEANS FOR COUPLING A BLADE TO AN ARM OF WINDSHIELD WIPER FOR AUTOMOBILES

Tadao Kushida, Odahara, Japan, assignor to Ichiko Industries, Limited, Shinagawa-ku, Japan

Filed Mar. 28, 1973, Ser. No. 345,789

Int. Cl. B60s 1/40

U.S. Cl. 15—250.32 7 Claims



Means for coupling a blade to an arm of windshield wiper for automobiles comprising (1) a housing having a top wall and two side walls cooperatively defining a channel for the insertion of the arm and (2) an arm nipping means fixed within the housing and including an upper resilient member and a lower resilient member. Each of the side walls of the housing has an upper and a lower horizontal flange at its one end to define an arm introducing inlet. The upper resilient member has a receiving hole to engage a projection of the arm. The lower resilient member has a projection to be inserted into the through-hole or a recess of the arm. Because of this structure of the coupling means, the latter is capable of firmly holding any one of the arms of the type having a projection and a recess and of a type having only a through-hole. The free outer end of the upper resilient member fixed within the housing is exposed outwardly from one end of the channel, whereas the free outer end of the lower resilient member is exposed from the longitudinal elongated opening formed on the lower side of the channel. Thus, by holding the exposed portions of these two resilient members away from each other, the attachment and the detachment of the arm can be performed very easily without damaging the arm and these resilient members.

3,831,223

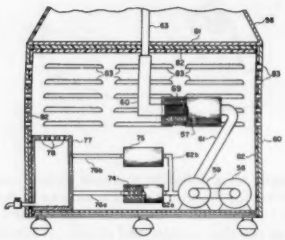
CARPET AND UPHOLSTERY CLEANING APPARATUS WITH IMPROVED NOISE MUFFLING FEATURE

James G. Colt, Belmont, and Ronald W. Emus, Jr., Billerica, both of Mass., assignors to Carpetech Corp., Natick, Mass.

Filed Jan. 31, 1972, Ser. No. 222,000

Int. Cl. A47l 7/00

U.S. Cl. 15—321 9 Claims



There is disclosed apparatus for cleaning carpets, upholstery and the like utilizing a meter driven separate reservoir system for supplying a cleaning solution to a remote cleaning head adapted to apply the cleaning solution to the material being cleaned, and a separate motor driven vacuum pick-up system for storing cleaning solution and entrained dirt picked up via the cleaning head. The reservoir system may typically include in combination with a reservoir tank a cleaning fluid pumping circuit comprising fluid heating means, a fluid pump for supplying fluid from the reservoir tank to the heating means, pressure regulator valve means for returning heated cleaning fluid to the reservoir tank when the fluid circuit to the cleaning head is closed, and flow sensitive means disposed between the reservoir tank and the fluid pump effective to disconnect the pump drive motor and shut down the fluid pump and heater when the supply of cleaning fluid in the reservoir tank is exhausted. The vacuum system includes a vacuum tank supported by a base housing, and in the base housing a motor driven vacuum pump for maintaining a partial vacuum in the vacuum tank, muffler means coupled to the vacuum pump and exhausting into a plenum chamber vented to the interior of the base housing, and high density material disposed on at least the inner side walls of the housing, together with a plurality of exhaust vents in the side walls of the housing.

3,831,224

TOGGLE LATCH WITH YOKE

Edward MacMaster, New Milford, and Paul R. Gley, Hillsdale, both of N.J., assignors to Rexnord, Inc., Milwaukee, Wis.

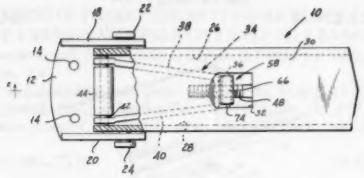
Filed Apr. 2, 1973, Ser. No. 346,829

Int. Cl. E05c 5/04

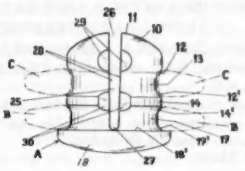
U.S. Cl. 24—68 T 11 Claims

A versatile toggle latch in which a yoke comprises a crosspiece which threadably receives the shank of a draw hook and a pair of slightly diverging legs the ends of which are pivoted on a handle at a location remote from a location at which the handle is pivoted on a mounting bracket, and in which an ele-

ment carried by a portion of the draw hook shank between the yoke legs prevents accidental rotation of the draw hook. The handle and crosspiece may be provided with interengageable secondary lock means or with a hasp on the draw hook shank adapted to extend through an opening in the handle.



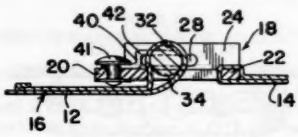
3,831,225
SPRING FASTENER
Sigurd W. Bengtsson, Goteborg, Sweden
Continuation of Ser. No. 227,198, Feb. 17, 1972, abandoned. This application June 5, 1973, Ser. No. 367,163
Int. Cl. F16b *5/00;* **A44b** *21/00*
U.S. Cl. 24—73 P **3 Claims**



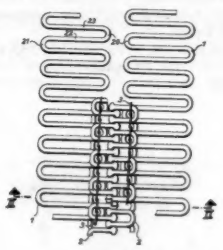
A spring fastener for connecting together separate layers of flexible sheet material, each of which is provided with a rigid annular eyelet. The spring fastener includes a plug-like body having a head at one end, a stop flange at the other end, and an intermediate flange therebetween. At each side of the intermediate flange there is a circumferential groove, a diametral slot extending axially from the head end to the stop flange. The fastener is molded from resilient plastic material and holds the eyelet in the groove adjacent to the stop flange with somewhat greater force than the eyelet in the other groove.

3,831,226
SEAT BELT SLACK ADJUSTER MECHANISM
Nels S. Nelson, and Harlow H. Piper, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 11, 1972, Ser. No. 314,151
Int. Cl. A44b *11/10*
U.S. Cl. 24—196 **7 Claims**

Apparatus for adjusting the length of a safety belt includes a base into which the end of a first safety belt portion and the end of a second safety belt portion are fed. The first safety belt portion is fed inward, around an elongated cylindrical member slidably mounted to the base and between the elongated cylindrical member and a portion of the base, so that it may be gripped therebetween. A spring is included for urging the elongated member in a gripping direction and into a gripping position relative to that portion of the base. The end of the second safety belt portion is secured to another portion of the base. Adjusting the belt involves slidably moving the elongated member against the force of the spring away from its associated base portion and sliding the first belt portion therebetween, to be gripped in another position.



3,831,227
SLIDE FASTENER STRINGER
Eduard Beitter, Koppenhoferweg 8, 7 Stuttgart 80, Germany
Filed May 15, 1972, Ser. No. 253,301
Int. Cl. A44b *19/10*
U.S. Cl. 24—205.16 C **9 Claims**



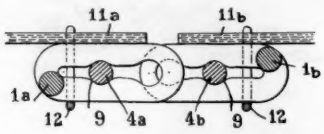
The carrier tape in an otherwise conventional slide fastener stringer having coupling elements formed from a continuous length of a plastic filament is replaced by another length of plastic filament bent into repeating units having each the shape of a meander, a figure-eight, and the like. Each unit has two bend portions and two connecting portions of which one connects the bend portions, and the other one connects the unit to an adjacent unit. The bend portions are arranged in two rows parallel to the row of coupling elements, one or two coupling elements being fastened to an adjacent bend portion by sewing stitches, by adhesive, or by welding. The carrier of plastic filament is more durable than any tape and is readily shaped to hold the coupling elements in an arcuate row of small radius of curvature.

3,831,228

SLIDE FASTENER CHAIN

Horst Jakob, Choisy-le-Roi, France, assignor to Societe Financiere Francaise De Licences Et Brevets, Choisy-le-Roi, France

Division of Ser. No. 204,593, Dec. 3, 1971, Pat. No. 3,750,260.
This application May 11, 1973, Ser. No. 359,402
Int. Cl. A44b 19/12
U.S. Cl. 24—205.1 C 1 Claim



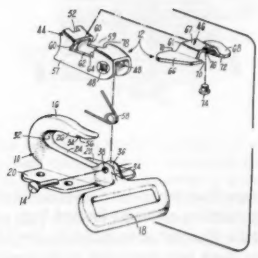
The invention provides a continuous chain of two rows of linking components for the making of slide fasteners out of two rows each consisting of a thread shaped into a spiral inside the whorls of which a longitudinal cord or strand is positioned, the improvement being that the said cord or strand is placed in an intermediate position in the width of each row by assembling the two corresponding rows while causing the linking components of each row to penetrate more deeply between the whorls of the other, in order to push back the length-ways inside cord or strand in the latter row, thereafter these two rows are fixed onto two supporting tapes by means of lines of stitching, the stitches of said lines being inserted inside the free spaces between the cord or strand inside each row and the portions connecting the successive whorls thereof.

3,831,229

ENVIRONMENT FREE SNAP HOOK

Wilbur J. Craven, Glastonbury, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed Feb. 20, 1973, Ser. No. 333,963
Int. Cl. A44b 13/02
U.S. Cl. 24—235 5 Claims



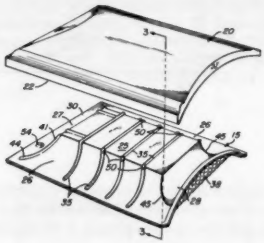
A forged snap hook is provided with an integral base plate for attachment to a parachute harness. A resiliently biased high strength corrosion treated guard is pivoted on the hook and has a hollow crown with slotted depending sidewalls. A winged finger piece is shaped to form an interlocked dovetail joint with the guard and the wings of the fingerplate overlap the slot of the guard and extend laterally therefrom adjacent the crown to reinforce the guard.

3,831,230

INTERIOR CAP LINER

Clifford Max Rawlings, c/o Rawlings Mfg. Co. Inc., Box 126, Lasantville, Ind. 47354

Filed Nov. 30, 1972, Ser. No. 310,828
Int. Cl. A61g 17/04
U.S. Cl. 27—19 6 Claims



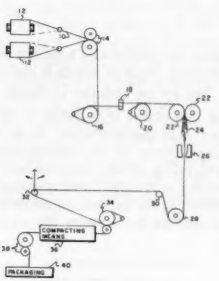
An interior cap liner for a casket is formed as a single, flexible, unitary, self-supporting and self-sustaining member. Structural reinforcing ribs are integrally formed in the liner to reinforce and rigidify it for self-support. The liner may easily be flexed for insertion into the casket cap, but is still strong and rigid enough to support decorative cover means attached exclusively to the liner inner surface. Within the cap, the peripheral edge of the liner rests in an unstressed condition on the casket cap's inwardly directed peripheral flange.

3,831,231

METHOD FOR PRODUCING A YARN HAVING LATENT BULKING CHARACTERISTICS

Jack C. Binford; Frederick A. Ethridge, and James R. Talbot, all of Charlotte, N.C., assignors to Fiber Industries, Inc., Charlotte, N.C.

Division of Ser. No. 848,549, Aug. 8, 1969, Pat. No. 3,654,677.
This application Nov. 1, 1971, Ser. No. 194,597
Int. Cl. D02g 1/12, 1/14
U.S. Cl. 28—72.14 16 Claims



A method for producing a yarn having latent bulking characteristics and the apparatus therefor is described. The yarn is composed of multifilament synthetic fibers which have been crimped and subjected to a constant tensioning process. The process involves subjecting a drawn yarn, preferably freshly drawn, to a crimping process which can be any of a number of crimping methods including stuffer box crimping, gear crimping, steam jet crimping and the like. The yarn is withdrawn from the crimping step under a low, substantially uniform tension, tensioning the yarn under a higher constant tension to at least partially extend the crimps, entangling or

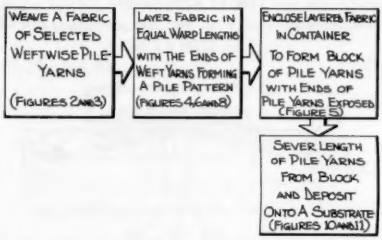
twisting the yarn and taking the yarn up on a package. The bulk characteristics of the yarn are preferably developed after incorporation into the end product such as a carpet by subjecting to heat and moisture.

3,831,232

METHOD OF PRODUCING PATTERNED BLOCKS OF PILE YARNS IN MAKING PATTERNED PILE FABRICS

Emanuele Bondi, Milan, Italy, assignor to Fieldcrest Mills, Inc., Eden, N.C.

Continuation-in-part of Ser. No. 34,756, May 5, 1970, abandoned. This application Dec. 20, 1972, Ser. No. 316,740
Claims priority, application Italy, May 10, 1969, 16675/69
Int. Cl. D04h *1/00*
U.S. Cl. 28—72 R **13 Claims**


WEAVE A FABRIC OF SELECTED WEFTWISE PILE YARNS (FIGURES 2 AND 3)
LAYER FABRIC IN EQUAL WARP LENGTHS WITH THE ENDS OF WEFT YARNS FORMING A PILE PATTERN (FIGURES 4,6 AND 8)
ENCLOSE LAYERED FABRIC IN CONTAINER TO FORM BLOCK OF PILE YARNS WITH ENDS OF PILE YARNS EXPOSED (FIGURE 5)
SEVER LENGTH OF PILE YARNS FROM BLOCK AND DEPOSIT ONTO A SUBSTRATE (FIGURES 10 AND 11)

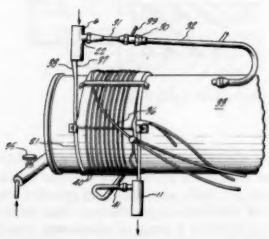
A method of producing blocks of pile yarns in making patterned pile fabrics, such as carpets, rugs and the like, whose patterns may be of many different colors or kinds of pile yarns and of simple or highly intricate configurations. According to the method, a fabric is woven from pile yarns of relatively different appearance; e.g., color, texture, etc., which serve as the wefts of the fabric and are selectively arranged in a predetermined patterned order and bound together by sparsely spaced binder warp yarns. Identifying weft yarns are positioned at substantially equally spaced locations in the fabric for determining successive fabric sections thereof, and the fabric is moved back and forth while being folded along the identifying weft yarns to form a compact stack of superposed fabric layers. The stack is positioned in an open-ended container with the ends of the pile yarns exposed so that they may be severed to form successive slices of patterned pile tufts therefrom which may be secured to a suitable substrate to form a pile fabric therefrom.

3,831,233

PROCESS FOR HEAT TREATING MULTI-COMPONENT YARNS

John L. Rendall; William Q. Rhyne, and Arthur Williams, all of Greenville, S.C., assignors to The Richen Co., Inc., Greenville, S.C.

Filed Feb. 9, 1972, Ser. No. 224,764
Int. Cl. D02j *1/22*
U.S. Cl. 28—72.17 **11 Claims**



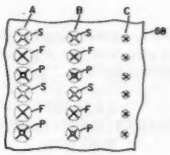
A process is disclosed for heat treating multi-component yarns which have fibers with dissimilar shrinkage properties. The multi-component yarn is heated in the absence of substantial tension on the yarn to a temperature above the shrinkage temperature of at least one component. The heated yarn is permitted to shrink without substantial yarn tension, and the yarn is subsequently cooled to set the same. The components of the yarn are rearranged within the structure of the set yarn, with the fibers possessing the greatest shrinkage rate being concentrated at the core of the yarn.

3,831,234

METHOD OF MANUFACTURING AN ELECTRICAL CAPACITOR

John Lapp, Franklin, and Norbert R. Weiler, Greendale, both of Wis., assignors to McGraw-Edison Company, Elgin, Ill.

Division of Ser. No. 255,156, March 10, 1972, Pat. No. 3,746,953. This application Apr. 6, 1973, Ser. No. 348,656
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.42 **26 Claims**



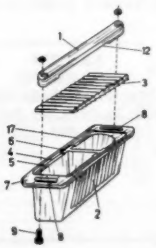
A power factor correction capacitor is constructed of several capacitor packs, each having convolutely wound layers of aluminum foil and polypropylene film with two layers of polypropylene film between the layers of foil. The several capacitor packs are assembled into a case and impregnated with trichlorodiphenyl with a bis (3, 4-epoxy-6-methylcyclohexylmethyl) adipate as an additive. During the winding process the foil is deformed by a deforming roller rolled against the roll of foil as it is wound into the capacitor pack.

3,831,235

FILE FOR SHARPENING SKI-EDGES

Peter Weninger, Karl-Schonherrstr. 1, 6410 Telfs, Austria

Filed Nov. 28, 1972, Ser. No. 309,975
Claims priority, application Austria, Nov. 29, 1971, 10230/71
Int. Cl. B23d *71/00*
U.S. Cl. 29—78 **10 Claims**



A file for sharpening ski-edges consisting of a hand held body member with a file plate mounted therein. The file plate is provided with a cutting surface that projects outwardly from said body member and a guiding ledge secured to said body member overlies said file plate for holding it in the body member with portions of the cutting surface of the file plate being disposed on opposite sides of the guiding ledge.

3,831,236
CUP-SHAPED CUTTING TOOL HAVING CUTTING TEETH

Orin W. Coburn, and Joe D. Stith, both of Muskogee, Okla., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.

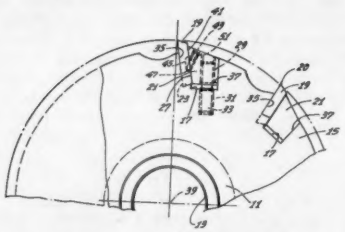
Filed Jan. 7, 1972, Ser. No. 216,166
Int. Cl. B26d *1/12, 1/00*
U.S. Cl. 29—103 R **8 Claims**

A cup-shaped tool for generating lens surfaces on a plastic lens blank wherein said tool has a plurality of spaced teeth along the cutting surface thereof.

3,831,237
MOUNTING APPARATUS FOR INDEXABLE CUTTING INSERTS

Claude A. Gunsalus, 19349 E. Tudor St., Covina, Calif. 91722

Filed July 20, 1972, Ser. No. 273,357
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 R **11 Claims**

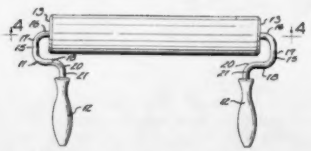


A rotatable milling cutter in which indexable milling inserts are positively retained within cavities at the end of the cutter body by a positive retention apparatus which may be embodied by a setscrew passing through a wedge to abut the side and/or bottom of a recess or pocket in one surface of the insert.

3,831,238
ROLLING PIN

J. Henry Adams, 64 Onyx Ave., Walla Walla, Wash. 99326

Filed Mar. 26, 1973, Ser. No. 344,984
Int. Cl. B05c *1/08*
U.S. Cl. 29—110.5 **1 Claim**

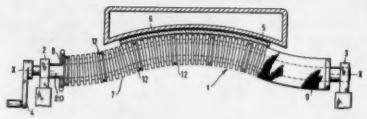


A rolling pin comprised of a roller, a shaft extending through the roller, and a pair of handles mounted to the ends of the shaft perpendicularly to the longitudinal axis of the roller. The roller includes a central bore of passageway which loosely receives a straight portion of the shaft and is freely rotatable thereon. The shaft is bent at its ends to position the handles inward of the ends of the roller.

3,831,239
APPARATUS FOR BENDING GLASS

Karl Heinz Hoff, Uebach-Palenberg; Peter Kupper, Alsdorf; Joseph Meyer, Stolberg; Werner Pagel, Merkstein; Heinz Schmitt, Aachen, all of Germany, and Maurice Nedelec, Versailles, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed June 22, 1973, Ser. No. 372,627
Claims priority, application France, June 23, 1972, 72.22800
Int. Cl. B21b *31/08*
U.S. Cl. 29—125 **5 Claims**

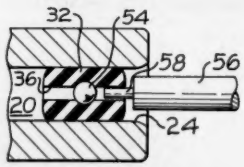


In glass bending apparatus employing an array of curved rods to define a cylindrical surface over which glass sheets heated to plasticity are traversed in order to conform them to that surface, the invention provides a roller construction which includes for each roller a corrugated tube engaged over a curved rod and caused to rotate and to flex with respect to the rod by suitable driving mechanism, the tube having a plurality of bearing rings affixed inside thereof between adjacent inwardly directed corrugations of the tube and disposed radially inwardly of an outwardly extending corrugation of reduced diameter at which annular sections of the tube are assembled as by welding at a circumferential seam. At each such seam a split ring is assembled over the seam to restore the outwardly extending corrugation of the tube to full diameter.

3,831,240
METHOD OF INSTALLING VENTED PLUGS IN PIN BORES

Roger L. Boggs; David John Balzer, both of East Peoria, and Glenn Melvin Haslett, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 130,664, April 2, 1971, Pat. No. 3,762,778. This application Apr. 6, 1973, Ser. No. 348,340
Int. Cl. B21h *7/00;* **B21k** *19/00*
U.S. Cl. 29—148.3 **2 Claims**



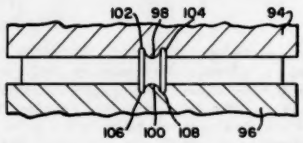
An improved method and apparatus are provided for sealing hollow pins which are commonly used as lubricant reservoirs in, e.g., track chain assemblies of crawler tractors, and linkage joints of earthmoving vehicles. One embodiment of the invention comprises a plug of elastomer material which has a lubricant passage axially therethrough, which passage receives an auxiliary plug means for the purpose of obturating the passage as well as causing radial expansion of the

elastomer plug into positive engagement with a receiving axial bore in a hollow pin. The auxiliary expansion means takes the form of a screw, a spherical ball, or a headless plug employing a plurality of annular serrations. Another embodiment comprises a spherical ball which is received in a stepped, axial bore of a hollow pin and is retained therein by a Belleville washer. The invention facilitates refilling in the field of the lubricant reservoir contained within the pin.

3,831,241
RADIAL AND THRUST BEARING AND METHOD OF MAKING SAME

J. Russell Elmore, New Hartford, and Carl F. Benson, Torrington, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Division of Ser. No. 311,302, Dec. 1, 1972, Pat. No. 3,795,960. This application Nov. 29, 1973, Ser. No. 420,055
Int. Cl. B21k *1/04*
U.S. Cl. 29—148.4 R **2 Claims**



A bearing is disclosed comprising a rotatable shaft and a coaxial unitary member. The shaft is shaped to provide a ball inner race and at least one roller inner race. The coaxial member has an inside annular protrusion extending toward the shaft. The protrusion has a curved shoulder on one side and a straight shoulder on the other side. The curved shoulder will support a high axial thrust along one direction of the shaft; the straight shoulder will support a relatively low axial thrust applied along the shaft in the opposite direction.

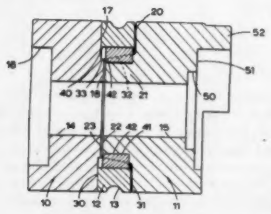
The outer unitary member is made by cold-forming a low carbon-steel tube with a die, carburizing, and then heating the thus-formed outer race in an inert atmosphere, sizing, and which after quenching, provides a hard outer race.

The shaft is made by rolling the ball inner race and at least one roller race into a rod which has been carburized and then heated in an inert atmosphere.

3,831,242
ROLLING MILL WORK ROLL ASSEMBLIES

Roy Ronald Oxlade, London, England, assignor to The British Iron and Steel Research Association, London, England

Division of Ser. No. 881,801, Dec. 3, 1969. This application Sept. 6, 1973, Ser. No. 394,882
Claims priority, application Great Britain, Dec. 10, 1968, 58650/68
Int. Cl. B23p *11/00*; B21d *39/00*
U.S. Cl. 29—148.4 D **4 Claims**

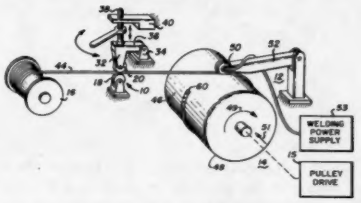


A method of manufacturing a rolling mill work roll assembly which comprises a work roll held in position on a hollow shaft member by the shaft member being in a stressed condition to exert radial loading and preferably also axial loading on the work roll. The grip is sufficient to transmit normal driving torque. The method comprises axially stretching the shaft by hydraulic pressure means acting within the hollow, and this causes reduction of the diameter of the hollow shaft to permit insertion and removal of the shaft into and from the work roll bore. The hollow shaft has a larger diameter than the work roll bore when not so stretched. After insertion the hydraulic pressure is removed and the shaft assumes the above stressed condition.

3,831,243
METHOD FOR MAKING SELF-CENTERING PULLEYS

Rene Conrad, San Mateo, Calif., assignor to Dynaloc Corporation, San Mateo, Calif.

Filed Sept. 24, 1973, Ser. No. 400,425
Int. Cl. B21h *1/14*; B21k *1/02*
U.S. Cl. 29—148.4 D **5 Claims**

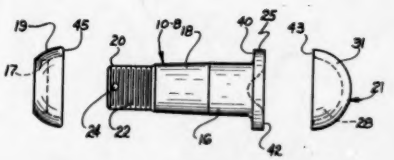


A method and apparatus for making self-centering pulleys wherein strips of half-round wire are tapered over their lengths so as to have a half-round configuration at one end and a substantially flattened configuration at the opposite end and are then spirally wrapped about a cylindrical drum and affixed thereto by spot welding. The apparatus includes a knurling and wire deforming device for effecting the tapering of the wire strips as the strips are fed onto the cylindrical drum, and a welding device for spot welding the wire strips to the drum surface as they are spirally wound thereabout.

3,831,244
METHOD OF PRODUCING BALL JOINTS

James J. Amos, Delaware, Ohio, assignor to The Columbus Auto Parts Company, Columbus, Ohio

Filed Mar. 1, 1973, Ser. No. 337,154
Int. Cl. B21d *53/10*; B23p *11/00*
U.S. Cl. 29—149.5 B **4 Claims**



A method of producing ball joints of the type that include a ball and stem member pivotally mounted in a housing, the method comprising forming the ball stud or pivoted member by heading a work-piece to provide an enlarged head portion that forms a first section of the spherical bearing surface of the ball stud, and by next forming additional head portions from work-pieces that provide additional sections of the spherical bearing surface of the ball stud. The formed work-pieces are

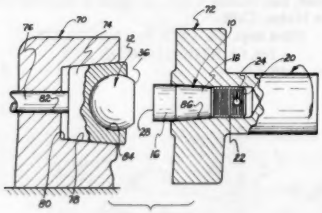
next welded together at confronting surfaces to provide fused junctions and the junctions and spherical surface is next machined to provide the finished bearing head of spherical contour.

3,831,245

METHOD OF PRODUCING BALL JOINTS

James J. Amos, Delaware, Ohio, assignor to The Columbus Auto Parts Company, Columbus, Ohio

Filed Mar. 1, 1973, Ser. No. 337,187
Int. Cl. B21d *53/10*; **B23k** *27/00*
U.S. Cl. 29—149.5 B **6 Claims**



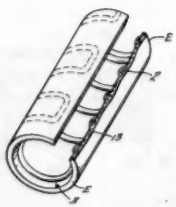
A method of producing ball joints of the type that include a ball and stem member pivotally mounted in a housing, the method comprising forming separate stem portions and ball portions and joining the portions at welded junctions with frictionally impored heat to provide pivot members of composite construction. Such pivot members are characterized by relatively large ball diameters as compared to the shank diameters so as to provide a high degree of angularity of movement.

3,831,246

METHOD OF FABRICATING A METAL TUBULAR HEAT EXCHANGER HAVING INTERNAL PASSAGES THEREIN

Jack Morris, Fort Lauderdale, Fla., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 22, 1973, Ser. No. 343,740
Int. Cl. B21d *53/02*; **B23p** *15/26*
U.S. Cl. 29—157.3 V **10 Claims**



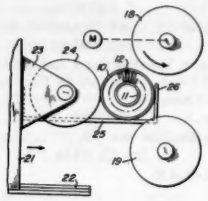
A heat exchanger tube, and a method and apparatus for forming a heat exchanger tube are disclosed. The tube is formed from a metal strip having inflatable passages. The passages are inflated after the tube is formed. In use, one fluid flows through the tube and at least one fluid flows through the wall passages. Another fluid, contacting the exterior of the tube, may be employed.

3,831,247

METHOD OF METALLURGICALLY BONDING A INTERNALLY FINNED HEAT EXCHANGE STRUCTURE

Raymond S. Degroote, Centerville, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Nov. 22, 1971, Ser. No. 201,003
Int. Cl. B21d *53/02*
U.S. Cl. 29—157.3 A **8 Claims**



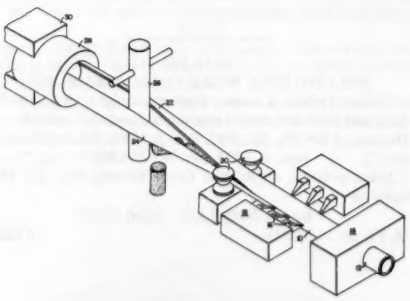
A method of achieving good thermal interchange between a tube wall and a tube installed fin annulus, providing secondary heat transfer surface, wherein fin corrugations are metallurgically bonded to the tube wall by a method inhibiting the bonding material from flowing to and blocking flow paths between the fin corrugations. A new fin material is used which maintains open flow paths through the fin material even when the material in strip form is rolled to a circular or arcuate configuration.

3,831,248

NUCLEAR REACTOR FUEL ROD SPLITTER

Robert Duncan, and Francis Cellier, both of Columbia, S.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 31, 1972, Ser. No. 258,332
Int. Cl. B23p *19/00*, *17/00*
U.S. Cl. 29—200 D **13 Claims**

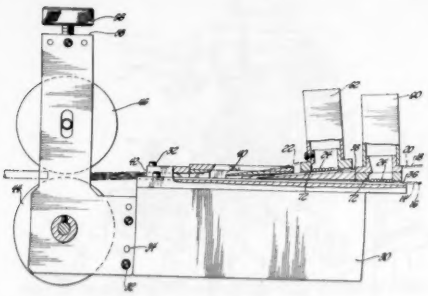


Apparatus for recovering fuel pellets from a fuel rod by cutting the rod lengthwise into two separate halves to allow fuel pellets therein to drop out of the rod cavity. A fuel rod is positioned in axial alignment with a stationary set of cutters on a table and a winch on the other end of the table pulls the rod through the cutters and in so doing, cuts a groove almost through the opposite sides of the rod. As the machine continues pulling the rod, it is caused to spread open and drop fuel rod pellets into a receptacle for later disposition The split halves of the fuel rod are then of a size and configuration convenient for efficient handling and disposal.

3,831,249
APPARATUS FOR ASSEMBLING ROLLER BEARING REMOTE CONTROL CABLES

Sheldon E. Perlman, Wyncote, and John C. Ion, Doylestown, both of Pa., assignors to Teleflex Incorporated, North Wales, Pa.

Filed Apr. 5, 1973, Ser. No. 348,411
Int. Cl. B23p *19/04*
U.S. Cl. 29—201 R **12 Claims**

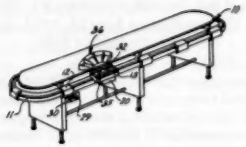


An apparatus is provided for assembling the components of a roller bearing remote control cable. Three confluent passages of the apparatus are fed, respectively, a first outer bearing race overlaid by a first elongated ball separator strip, a center core overlaid by a second elongated ball separator strip, and a second outer bearing race. First and second gravity feed ball bearing hoppers having converging wall portions provide a line of ball bearings respectively aligned with each of the passages carrying an elongated ball separator strip. As the elongated ball separator strips pass these lines of ball bearings, balls load the elongated ball separator strips. The first outer bearing race, the first elongated ball separator strip loaded with balls, the center core, the second elongated ball separator strip loaded with balls, and the second outer bearing race pass through a common passageway to a pair of wheels which frictionally engage the assembled components for alignment with and insertion into an outer sheath thereby completing the assembly of the roller bearing remote control cable.

3,831,250
METHOD AND APPARATUS FOR ASSEMBLING PRINTED CIRCUIT BOARDS

William G. Holiday, Overland Park, Kans., assignor to King Radio Corporation, Olathe, Kans.

Filed June 21, 1971, Ser. No. 154,880
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B **1 Claim**



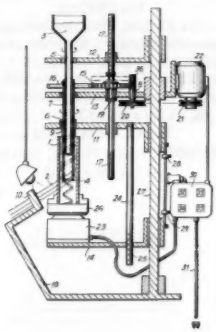
The method of assembling circuit components on printed circuit boards includes the steps of
aligning an apertured printed circuit board with a similarly apertured template,
color coding the apertures in said template,
illuminating said color coded apertures in said template,
viewing said illuminated colors through said apertures in said printed circuit board, and
placing said circuit component parts on said printed circuit board in accordance with the color appearing through the apertures in said printed circuit board.

A light station has a high intensity light source attached to the upper portion of an assembly station or dolly with a white Plexiglas panel located on the upper portion thereof. The end portions of the Plexiglas panel are provided with magnetic strips and the entire structure is located interiorly of a frame support. The side wall portions of the frame support are appropriately formed to locate a frame containing a printed circuit board in spaced relation with respect to the Plexiglas panel and to provide for the location of a suitably apertured generally opaque template. The template has matching magnetic strips thereon to facilitate the position of the template with respect to both the printed circuit frame and the Plexiglas panel. Circuitry is provided for the safe energization of the light source when utilized with a programmed line.

3,831,251
MACHINE FOR PRODUCTION OF HIGH VOLTAGE FUSES WITHOUT INSULATING CHAPLET AND WITH MELTING ELEMENTS OF DIFFERENT CROSS SECTION

Manoilov Aleksandar, Marjana Baruna 47, and Karisik Mustafa, Bratstva i Jedinstva, both of Sarajevo, Yugoslavia

Filed Jan. 29, 1973, Ser. No. 327,850
Int. Cl. H05k *13/00*
U.S. Cl. 29—203 R **9 Claims**



A machine for production of high voltage fuses without holders for the fuse elements comprising a clamping device for supporting a hollow fuse body below a hopper which is adapted for introducing sand into the fuse body. A platform supports the hopper and is adapted for raising and lowering the hopper so as to introduce and retract the same into and from the fuse body. Melting material which is to form the fuse element is coiled into the fuse body and the fuse body is filled with sand which is compacted therein around the coiled melting material. As a consequence, the melting material is supported within the fuse body in the sand without need for a holder for the fuse element.

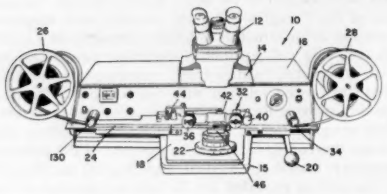
3,831,252
ASSEMBLING AND SECURING MACHINE

Charles Frederick Miller, 2165 N. Glassell, Orange, Calif. 92667

Filed Apr. 16, 1973, Ser. No. 351,226
Int. Cl. H05k *13/00*
U.S. Cl. 29—203 B **17 Claims**

An assembling and securing machine is disclosed which is capable of positioning a tape, such as a strip of film on which circuit runs are imprinted. The tape is positioned relative to a component to be bonded to those circuit runs and to a work

tool by which the bonding is completed. There is a need to align the tool, circuit run, and component to compensate for

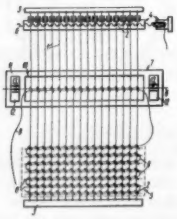


manufacturing variations in their positions and dimensions and the instrument is arranged so that compension for those variables are possible and easily accomplished.

3,831,253
APPARATUS FOR MAKING MEMORY STORAGE MATRICES

Jury Alexandrovich Burkin, Tsvetnoi proezd, 29, kv. 24, and Jury Emelyanovich Seleznev, Vesenny proezd 4a, k.v. 16, both of Novosibirsk, U.S.S.R.

Filed June 15, 1973, Ser. No. 370,468
Claims priority, application U.S.S.R., Apr. 27, 1972, 1776225; June 16, 1972, 1797282
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 MM **9 Claims**

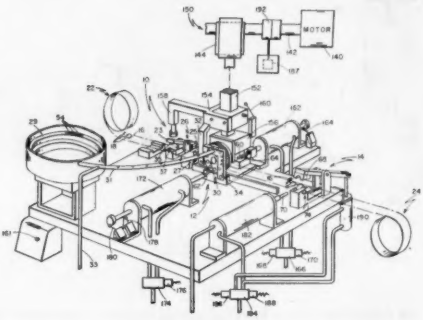


An apparatus for making memory storage matrices comprises Y coordinate drive wires strung through cores, wire fastening assemblies, a threading member for threading matrices with X coordinate drive wires, a threading mechanism for wiring a digit winding through the matrix cores, which includes a movable positioning mechanism connected with threaded bushings and disposed at an angle to the X wires, and tension devices with clamps, the positioning mechanism being made as a moving roll split into sections with handles having one longitudinal slot and grooves receiving the Y wires, the grooves for the Y wires being in the form of a spiral. The positioning mechanism can also be a vertically movable support positioned at an angle to the X wires and fitted with a means for forcing the Y-wire bundles closer together, comprising two members moving towards each other having teeth secured thereupon. The means for forcing the Y-wire bundles closer together may also be made as tension springs disposed against each Y-wire bundle.

3,831,254
APPARATUS FOR ASSEMBLING INSULATED TERMINALS

Donald R. Weber, Walpole; Harry Vincent Leaf, Marshfield, and Charles Joseph Daly, Quincy, all of Mass., assignors to Ark-Les Switch Corporation, Watertown, Mass.

Filed June 20, 1973, Ser. No. 371,682
Int. Cl. H01r *43/04*; **B23p** *19/04*
U.S. Cl. 29—203 D **8 Claims**



Apparatus for assembling sleeve insulators to a succession of terminals comprising a plurality of insulator retaining means, indexing means successively to place each insulator retaining means in first and second operative positions, insulator feed means to place an insulator within an insulator retaining means, and forming means for forming the insulator in the insulator retaining means in the first operative position. Feed means is provided for advancing the succession of terminals to place a terminal adjacent the second operative position insulator retaining means, and support means internally supports the adjacent terminal. The apparatus further includes assembly means for assembling the formed insulator in a second operative position insulator retaining means onto an adjacent terminal responsive to the operation of the forming means and support means; the feed means and indexing means are operative responsive to operation of the assembly means to advance the succession of terminals and to index the insulator retaining means.

3,831,255
APPARATUS AND METHOD FOR FORMING SHAPED INSULATORS

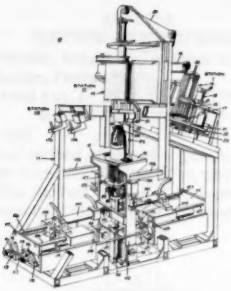
Dallas F. Smith, and Richard B. Arnold, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 119,618, March 1, 1971, Pat. No. 3,742,596. This application June 25, 1973, Ser. No. 373,129
Int. Cl. H02k *15/00*
U.S. Cl. 29—205 E **4 Claims**

Method and apparatus for forming shaped insulators and for developing coil turns into coil groups and inserting the insulators and coils into preselected slots of a magnetic core. The insulators are automatically formed at an insulator-forming station by an assembly including control mechanism for providing a series of insulators corresponding to predetermined slots of the core. Insulator and coil insertion tooling is movable between the insulator-forming station, to receive formed insulators; the turn-forming station, to receive coil turns; and an insertion station, at which insulators and coil turns are inserted from the insertion tooling into the magnetic core.

The insulator and coil insertion tooling is mounted for pivotal movement about a horizontal axis so that it swings through a generally vertical plane. The insulator-forming sta-

tion, the turn-forming station and the insertion station intersect this plane. The turn-forming assembly and the tooling are aligned during coil turn generation and some previously generated turns are received in the tooling as other turns are generated. Also the tooling is rotatable, relative to the coil turn-forming assembly, so that turns for each electric phase



may be received in the tooling angularly displaced from other phases. Apparatus has two winding head mechanisms for easily generating turns for two phases from different wire. Insulator-forming control mechanisms can be set so that the insulator-forming assembly will provide insulators in predetermined series which correspond to different series of slots of the magnetic core.

3,831,256

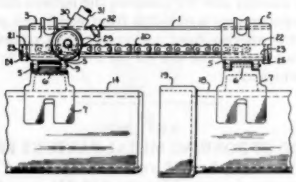
PLASTIC PIPE ASSEMBLY TOOL

Bengt G. Bjalme, and Thomas G. Brown, both of Erie, Pa., assignors to Reed Manufacturing Company, Erie, Pa.

Filed Apr. 26, 1973, Ser. No. 354,891

Int. Cl. B23p *19/04*

U.S. Cl. 29—237 **8 Claims**



A tool for assembling telescoping sections of plastic pipes or fittings having an axially extending beam over which are telescoped a pair of axially extending brackets, one of which is fixed to the beam and the other of which is slidable on the beam. Pipe engaging shoes are mounted on the brackets by interengaging knuckles and pins and have semicylindrical surfaces clamped to the pipe by link chains. The movable bracket is reciprocated by a rack and pinion drive which in a preferred form consists of a link chain fixed to the beam and a sprocket journaled in the movable bracket and rotated by a ratchet drive.

3,831,257

METHOD AND APPARATUS FOR ASSEMBLING WELDED TRACK HINGE JOINTS

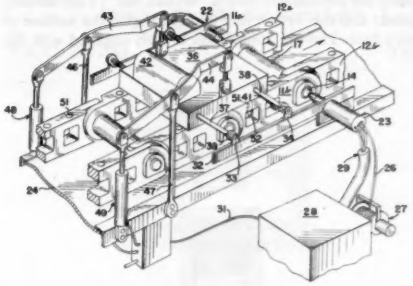
Roger L. Boggs, and Duane L. Burk, both of East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 11, 1973, Ser. No. 349,922

Int. Cl. B23p *7/00*; B21l *9/06*

U.S. Cl. 29—401 **5 Claims**

A method and apparatus for rapidly and efficiently welding track hinge joints wherein the assembled track hinge joint is supported in a suitable fixture and welding guns are supported for movement in a circular path approximating the circumference of a track pin which is to be secured at its ends to respective track links. Additional means initially align the welding guns with the track pins, operation of the welding guns being regulated by suitable control means. The welding



method and apparatus described above may also be employed for rebuilding endless track including a plurality of track hinge joints. Additional power units are employed to initially remove the track pin from the track hinge joint in order to prepare the track links for welding in subsequent reassembly as described above.

3,831,258

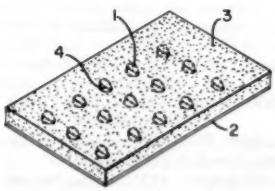
REINFORCED POROUS METAL STRUCTURE AND MANUFACTURE THEREOF

Raymond J. Elbert, Middleburg Heights, and Ernest G. Farrier, Parma, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 20, 1971, Ser. No. 209,820

Int. Cl. B22f *7/04*

U.S. Cl. 29—420 **10 Claims**



A reinforced porous metal structure, and manufacture thereof, comprising a porous metal material secured to a backing sheet having on at least a portion of its surface projected segments formed from the surface and being imbedded in the porous metal material. The reinforced porous metal structure substantially reduces spalling, tearing, and the delamination of the porous metal material when it is used in such applications as abradable seals, bearings and bearing retainers, and brake liners.

3,831,259

A METHOD OF PROVIDING A SOLID GALL PREVENTER IN A PIN AND BOX JOINT

Bobbie D. Goulas, Lafayette, La., assignor to BG & F Inc., Lafayette, La.

Filed Apr. 13, 1972, Ser. No. 243,774

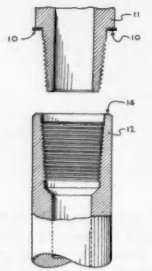
Int. Cl. B23p *19/00*

U.S. Cl. 29—428 **3 Claims**

A solid thin hydrocarbon plastic gasket, preferably of polytetrafluoroethylene ("Teflon"), in the form of a round

thin ring of approximately one-thirty-seconds inch (1/32 inch) thickness and a predetermined diameter acting as a gall preventor for pin and box connections of tool joints primarily used in rotary oil well drilling. The thin ring has an inner and outer diameter (before it is compressed) which coincides (± 1/32 of an inch) with the outer and exterior diameters of the particular pin joint on which it is used.

Initially the pin and box joint is "broken out" (if not already separated) and the Teflon ring is placed upon the surface of the pin's face. The pin connection is then engaged with the



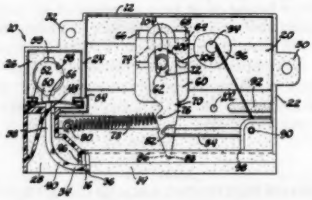
box connection and screwed together or "made up". As pin and box joint are screwed together the faces of the two connections will compress the thin ring forcing some of the material into the counter bore of the box connection while simultaneously some of the material is forced from the faces to extend on the outside of both connections. A solid, thin, gall preventing film of approximately two-thousandths of an inch (2/1000 inch) thickness remains between the faces, thereby protecting the tool joint faces from the deleterious effects of galling while permitting them to seal properly.

3,831,260

METHOD OF ASSEMBLING SHIFT INDICATOR ARRANGEMENT

Robert E. Gilbert, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 4, 1973, Ser. No. 394,150
Int. Cl. B23p *19/00*
U.S. Cl. 29—434 **4 Claims**



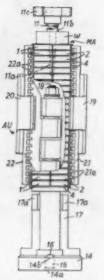
The drawings illustrate a shift indicator arrangement including a housing and means for mounting and operatively retaining an indicator member therein without benefit of any screws or fasteners as have been required heretofore.

3,831,261

MANDREL ASSEMBLY FOR PATTERN DISC PREPARATION MACHINES

Dennis Gell, Leicester, England, assignor to Stibbe-Monk Developments Limited, Leicester, England

Filed Jan. 22, 1973, Ser. No. 325,746
Int. Cl. B23q *3/00*
U.S. Cl. 29—467 **16 Claims**



An assembly comprising a mandrel having thereon spaced pattern discs and intervening split mandrel spacers each comprising two complementary parts in contact with the mandrel, these discs and spacers being clamped together facially. The assembly is used in a pattern disc preparation machine for breaking teeth of pattern discs of knitting machine pattern units.

The complementary mandrel spacer parts are either separate and unconnected or connected but readily separable for disengagement from the mandrel. The sides of such parts may be recessed to receive pattern unit spacers of smaller diameter.

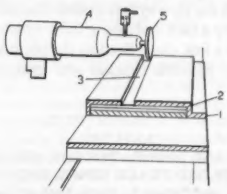
The invention includes an upright assembling unit to facilitate assembly of disc and spacers on to a mandrel. It also includes a transfer unit for enabling the pattern discs and pattern unit spacers, on a mandrel from which the parts of the split mandrel spacers have previously been released and allowed to fall away, to be slid off the mandrel on to an aligned pattern unit spindle.

3,831,262

METHOD OF BONDING METAL PARTS BY FRICTION

Penelope Jane Vesey Luc, 18, rue Fourcroy, Paris 17e, France

Continuation-in-part of Ser. No. 830,831, June 6, 1969, abandoned. This application Mar. 3, 1972, Ser. No. 231,703
Claims priority, application Great Britain, Mar. 9, 1971, 6344/71
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 **13 Claims**



Two or more metal parts are joined by a frictional process in which the parts are held in intimate contact while a rapidly rotating wheel is applied to one of them. The frictional process may produce vibrational energy in a wide band of sonic and

ultrasonic frequencies and an intense, very short, pulse of thermal energy at the interface. Joints may be produced without apparent indications of fusion at the interface.

3,831,263

METHOD OF SOLDERING

Stanley F. Dzierski, Arnold, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 11, 1972, Ser. No. 279,826
Int. Cl. B23k *31/02, 35/12*
U.S. Cl. 29—503 **9 Claims**

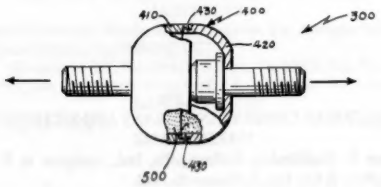
An improved method of soldering aluminum members employs a solder consisting essentially of zinc, aluminum, and beryllium. The method uses dip or immersion soldering techniques, especially those involving ultrasonically energized baths.

3,831,264

METHOD OF CONNECTING SUBSTANTIAL SIMILAR METAL PARTS

Ollney B. Terrell, Richmond, Ind., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 22, 1973, Ser. No. 334,793
Int. Cl. B21d *39/00*
U.S. Cl. 29—517 **2 Claims**



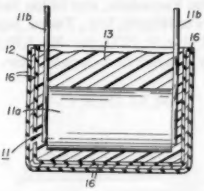
Two substantially similar metal parts are connected by forming a male configuration at the end of the first metal part forming a complementary female configuration at the end of the second substantially similar metal part; flaring the female configurated end of the first part to accept the male configurated end of the second part; positioning the two parts so that they are disposed female end to male end, and also so that they are axially aligned; inserting the male configurated end of the first part into the female configurated end of the second part, while maintaining axial alignment of the parts, whereby the two configurated ends are releasably engaged; and, squeezing the flared female end, whereby the two configurated ends are mated. As a result, a positive, permanent, and interlocking joint is formed, and the two substantially similar metal parts are permanently and reliably connected inexpensively, simply, and quickly. This method is exceptionally well-suited for use during the manufacture of a spherical bomblet, which comprises two similar metal hemispheres which are filled with explosive, in connecting the respective free and open end of each of the two similar and explosive-filled metal hemispheres, and thereby preventing the pinching, and the subsequent inadvertent and unintended detonating, of the explosive.

3,831,265

METHOD OF PACKAGING AN ELECTRICAL DEVICE

Theodore J. Louzon, Bolingbrook, Ill.; William McMahon, Summit, N.J., and John J. Mellon, Westchester, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J., by said McMahon and Western Electric Company, Incorporated, New York, N.Y., by said Louzon and Mellon

Filed Jan. 23, 1973, Ser. No. 325,987
Int. Cl. H01g *1/02, 13/00*
U.S. Cl. 29—592 **7 Claims**



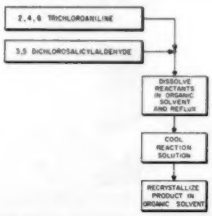
An electrical device having a pair of projecting leads, such as a capacitor, is packaged in an aluminum container by first chemically etching the inner and outer surfaces of the container and then chemically oxidizing the surfaces with an ammonium hydroxide solution to form a film layer of various aluminum compounds thereon. The container then is heat treated to break down and convert a substantial portion of the formed aluminum compounds to aluminum oxide (Al_2O_3), and to further oxidize the surfaces of the container, with the ammonia being driven off in the form of a gas so as to leave no contaminating residue, thus producing a dielectric film layer comprised primarily of aluminum oxide (Al_2O_3) and having a substantially increased d.c. voltage breakdown strength in comparison to the d.c. voltage breakdown strength of the initially formed layer. The electrical device then is placed in the container with its leads projecting therefrom, and a dielectric potting material is introduced into the container to form a substantially fluid-impervious bond with the inner aluminum oxide surfaces. In the alternative, the container may be subjected to additional oxidizing by an ammonium hydroxide solution and heat-dried, to further increase the d.c. voltage breakdown strength of the dielectric film layer, prior to encapsulating the electrical device in the container.

3,831,266

METHOD FOR MAKING AN INFORMATION STORAGE DEVICE HAVING PHOTOCHROMIC AREAS OF 3.5 DICHLOROSALICYLIDENE 2,4,6 TRICHLOROANILINE

Maurine M. Schiffmann, Minneapolis, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 884,650, Dec. 12, 1969, abandoned.
This application Apr. 27, 1972, Ser. No. 248,171
Int. Cl. H01s *4/00*
U.S. Cl. 29—592 **2 Claims**



A method for preparing a highly photochromic anil of 3,5 dichlorosalicylidene 2,4,6 trichloroaniline which comprises

preparing a reactant mixture of 2,4,6 trichloroaniline and 3,5 dichlorosalicylaldehyde, heating the reactants, preferably while in a solvent solution of amyl alcohol, to a temperature in the range of between about 135°–145° C. and maintaining this temperature until the reaction forming 3,5 dichlorosalicylidene 2,4,6 trichloroaniline is substantially complete, and thereafter isolating the reaction product from the reactant mass by recrystallization techniques.

3,831,267

METHOD OF MANUFACTURING A SLEEVE ARMATURE

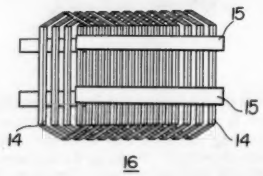
Kazuo Onishi; Seizi Yamashita, and Mikio Sato, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 9, 1973, Ser. No. 339,918

Claims priority, application Japan, Mar. 10, 1972, 47-24020

Int. Cl. H02k 15/02

U.S. Cl. 29—598 4 Claims



A sleeve armature and a method of manufacturing the same in which a number of component coils composing the winding are uniformly mounted flatly and in a partly superimposed manner on the circumference of an inner mold, and after the coils are impregnated with a thermosetting resin, the coils mounted on the inner mold are enclosed with a thermocontracting coating, and then the structure is heated. The thermocontracting coating contracts and applies a uniform pressing force to the coils and the thermosetting resin, and at the same time the thermosetting resin is set.

3,831,268

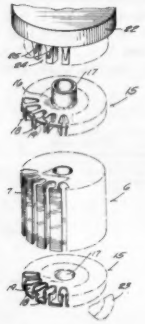
METHOD OF MAKING AN ELECTRIC MOTOR ARMATURE CORE

Edward A. Boyd, Sussex, and Joseph R. Harkness, Germantown, both of Wis., assignors to Briggs Stratton Corporation, Wauwatosa, Wis.

Filed Dec. 3, 1973, Ser. No. 420,940

Int. Cl. H02k 15/02

U.S. Cl. 29—598 10 Claims



An armature core assembly in which the heads of the circumferentially spaced T-shaped teeth that form the peripheral portion of the laminated coilreceiving core have their opposite end portions taperingly deformed to widen the entrances to the reentrant coil receiving spaces or slots between the T-shaped teeth at opposite ends of the core. A preformed plastic shield or cap of the same size and shape as the laminations which comprise the core, completely covers each end of the core and has protective flanges that embrance the ends of its T-shaped teeth, including the head, the taperingly reduced width of the end portions of the head providing space for those portions of the protective flanges that embrace the heads, so that the presence of these protective flanges does not objectionably reduce the width of the entrances to the wire receiving slots.

3,831,269

METHOD OF MAKING THIN FILM THERMISTOR

Alfred Sommer, Teaneck, N.J., assignor to Ceramic Magnetics Inc., Fairfield, N.J.

Filed Aug. 2, 1973, Ser. No. 384,949

Int. Cl. H01c 7/04

U.S. Cl. 29—612 10 Claims

A method of manufacturing a thin film thermistor in which the reagent grade materials are dissolved in water and allowed to intimately mix therein after which the mixture is spray-dried under pressure to obtain a fine powder which is the true thermistor composition desired. After oxidation at high temperatures for a long period of time to remove sulphites etc., the resulting oxides are mixed in a bone milling process with a plastic binder which is then poured on to a glass plate and spread to a predetermined thickness and allowed to dry, after which the material is placed on a ceramic plate and fired to bond the plastic and ceramic and burn out portions of the plastic whereupon electrodes are attached to the final thermistor.

3,831,270

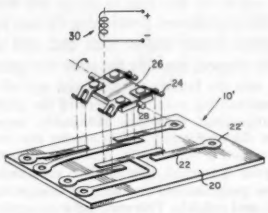
ELECTRICAL CONDUCTING MEANS AND METHOD OF MAKING SAME

Robert F. Huddleston, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Continuation of Ser. No. 76,261, Sept. 28, 1970, abandoned, which is a division of Ser. No. 830,248, June 4, 1969, abandoned. This application Aug. 21, 1972, Ser. No. 282,258

Int. Cl. H05k 3/02, 3/10

U.S. Cl. 29—625 14 Claims

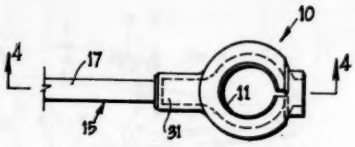


Electrical conducting paths of a rolled metallic composite, which includes an electrically conductive material and a refractory metal, are formed on an insulative base in a predetermined pattern to provide a printed circuit board.

3,831,271
BATTERY TERMINAL

Richard John Pedler, Camden Park, Australia, assignor to Camelec Limited, Camden Park, South Australia, Australia

Filed Oct. 5, 1972, Ser. No. 295,171
Claims priority, application Australia, Oct. 14, 1971, 6635/71
Int. Cl. H02g 15/00
U.S. Cl. 29—628 3 Claims

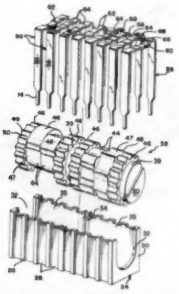


A battery terminal connector for connecting to a battery of the type having a frusto conical battery terminal post, the connector having a part circular bifurcate ring with a resin based plastics outer casing which is also of bifurcate shape but has overlapping lugs the ends of which, when moved towards one another, spread the arms of the connector, the casing comprising resilient means for retaining the connector to the battery terminal post.

3,831,272
METHOD OF MAKING SELECTIVE SWITCH CONTACTS

Harold Lawrence Purdy, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 306,113, Nov. 13, 1972, Pat. No. 3,792,206. This application Sept. 18, 1973, Ser. No. 398,505
Int. Cl. H01r 9/00
U.S. Cl. 29—630 R 4 Claims

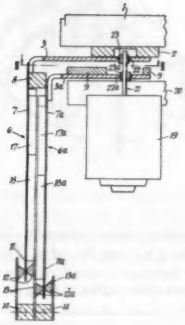


This invention relates to a switch having four parts including the housing. More particularly the invention relates to a frame which has 16 positions which can be binary coded. The sixteen positions consist of four single pole-double throw contacts all of which are made by stamping and forming a single sheet of metal. The movable contacts are switched from one fixed contact to another by lobes on a rotatable camshaft.

3,831,273
ELECTRIC SHAVERS

Roger Paul Wellinger, Neuchatel, Switzerland, assignor to The Gillette Company, Boston, Mass.

Filed July 20, 1972, Ser. No. 273,478
Claims priority, application Great Britain, July 27, 1971, 35176/71
Int. Cl. B26b 19/02
U.S. Cl. 30—43.92 7 Claims



A dry shaver comprising a cutter guided for reciprocating movement along a substantially linear path by means of at least two resilient members extending generally perpendicular to said path, each resilient member comprising a stem and at least two legs projecting from one end of the stem in continuation thereof, the free end of at least one leg being secured to the cutter and the free end of at least one other leg being secured to a fixed part of the shaver, and the free end of the stem being restrained against vibration in the direction parallel to the path of reciprocation of the cutter.

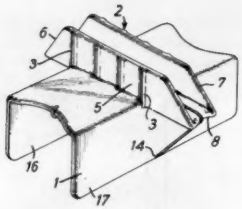
3,831,274
JACKET STRIPPER

Raymond G. Horrocks, Parkview, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Dec. 28, 1973, Ser. No. 429,049
Int. Cl. B21f 13/00
U.S. Cl. 30—90.4 1 Claim

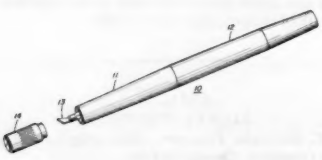
A tool for use in stripping an insulating jacket from an electrically conductive cable includes a plastic handle and a cast high speed steel stripper. The stripper includes a shank embedded in the handle, a blade having a cutting edge, a foot and a guard.

3,831,275
CUTTER FOR CUTTING MITRED EDGES
Rene Jordache, 42 Laurier Rd., London, England
Filed Dec. 29, 1972, Ser. No. 319,874
Claims priority, application Great Britain, June 1, 1972, 25641/72
Int. Cl. A21c 5/00
U.S. Cl. 30—116 7 Claims



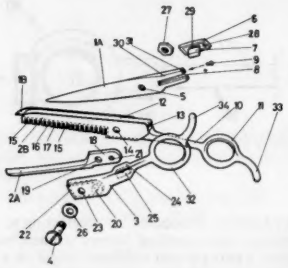
A cutter for cutting mitred edges on clay tile. The cutter has a flange for guiding it along the edge. The cutting of the mitre is effected by a taut wire extending between the flange and a bridge mounted at right angles to the guide.

3,831,276
CONVERTIBLE SWIVEL KNIFE WHICH ILLUMINATES WORK AREA
William S. Dalton, Box 27, Chesterfield, Md. 01012, and Franklyn G. Umholtz, Locks Pond Rd., Shutesbury, Mass. 01072
Filed July 31, 1973, Ser. No. 384,191
Int. Cl. B26b 1/04
U.S. Cl. 30—123 R 7 Claims



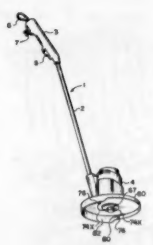
A convertible swivel knife which includes first and second sub-assemblies. The first sub-assembly comprises a first tubular housing having front and rear ends. A light-transmissive tube is rigidly fitted within the first housing, the tube having exposed edges at both the front and rear ends of the first housing. An elongated generally cylindrical stem is mounted within the tube, the stem being normally rotatable with respect to the tube. The stem has a blade-holding end which protrudes from the front end of the first housing. An adjustable means is provided for rigidly coupling the stem to the inner surface of the tube. The second tubular housing has front and rear ends, the front end of the second housing being removably mounted to the rear end of the second housing being removably mounted to the rear end of the first housing. Light generating means are mounted within the second housing and oriented to project light through the front end of the second housing. In operation, the generated light is transmitted by the light tube to the front end of the first housing to illuminate the areas surrounding the blade-holding end of the stem. Using the adjustable means, the craftsman can lock the stem so that it does not swivel with respect to the housing during applications where a rigid blade is desirable.

3,831,277
COMBINATION SCISSORS FOR BOTH HAIR-CUTTING AND HAIR-THINNING
Masamichi Nagata, Seki City, Japan, assignor to Kabushiki Kaisha Hasegawa Hamono Seisakusho, Seki City, Gifu Prefecture, Japan
Filed July 23, 1973, Ser. No. 381,564
Claims priority, application Japan, Aug. 11, 1972, 47-94983
Int. Cl. B26b 19/22
U.S. Cl. 30—195 3 Claims



The present invention relates to a pair of scissors which has a combined use wherein it could perform an operation for both cutting and thinning of hair. One handle operates and is fixed to a thinning blade and is releasably secured by a shifting piece to another cutting blade. Thus the scissors is capable of cutting or thinning or cutting and thinning simultaneously.

3,831,278
GRASS TRIMMER
Harry M. Voglesonger, Riverton, Conn., assignor to Dynamics Corporation of America, New York, N.Y.
Filed Aug. 3, 1972, Ser. No. 277,658
Int. Cl. B26b 27/00
U.S. Cl. 30—276 10 Claims

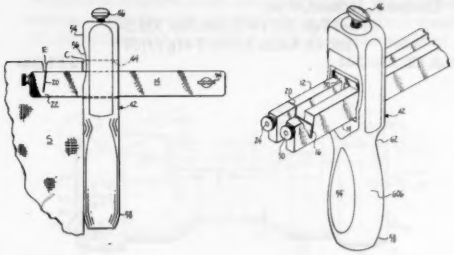


A pair of stress oriented radially disposed plastic filaments or strands rotated at high speed is employed as the cutting or slicing elements for a manually manipulated grass trimmer including a motor drive, a shroud plate and supporting handle. A convenient form of cutter having an integral hub with diametrically oriented radial strands extending therefrom is disclosed. In one embodiment the molded strands are stress oriented by stretching longitudinally to the extent of their elasticity to increase their strength and reduce the diameter.

3,831,279
STRAP CUTTER FOR LEATHER AND LIKE MATERIAL

Brian N. Burns, 1263 Stanford Ave., Palo Alto, Calif. 94306

Filed June 8, 1973, Ser. No. 368,322
Int. Cl. B26b *3/03*
U.S. Cl. 30—280 13 Claims

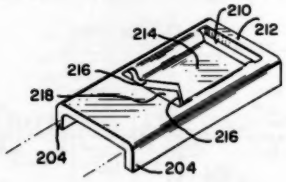


A tool for cutting a strap from the edge margin of a piece of leather or like material. Two rigid bars that are supported in spaced apart relation by a cutting blade at one end and an adjustable spacer at the other end. Blade clamps on each bar support both ends of the blade. A handle having an opening in which the bars are clamped and a guide surface to engage the edge of the leather sheet. The handle has a releasable clamp to permit adjustment of the distance between the blade and the guide surface. The opening in the handle is sufficiently large that angular adjustment of the blade relative to the guide surface is possible.

3,831,280
STRAPPING SEVERING TOOL

Jack Brothers, 806 Tuxedo Dr., Wright, Fla. 32548, and Walter J. Fuzia, 3 Richard Dr., West, Mount Arlington, N.J. 07856

Division of Ser. No. 256,155, May 23, 1972, Pat. No. 3,791,031, which is a continuation-in-part of Ser. No. 124,822, March 16, 1971, abandoned. This application Nov. 26, 1973, Ser. No. 418,828
Int. Cl. B26b *11/00*
U.S. Cl. 30—296 R 10 Claims

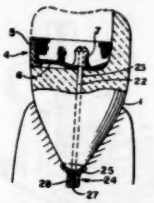


A simple longitudinally extending body defines the tool, the body having enveloping surfaces for engaging strapping banding and to accommodate the travel of the tool with a strapping banded item. One or more of the surfaces defines a severing edge for severingly parting the banding, i.e., the strapping, upon the terminal-end handle of the tool being raised or moved transverse to the strapping. In some embodiments, the tool further defines means for clasping and securing juxtaposed terminal ends of strapping, that the strapping might be secured about the item — shipping crate, or whatever.

3,831,281
METHOD AND APPARATUS FOR TOOTH RESTORATION

Alfred E. Edelman, 2723 Federal St., Camden, N.J. 08105

Division of Ser. No. 116,038, Feb. 17, 1971. This application Oct. 26, 1972, Ser. No. 301,135
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 3 Claims

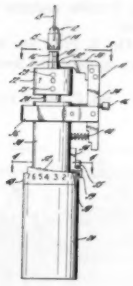


A stabilizing device for a loose tooth and a restoration for a tooth having a cavity left in the tooth by the breaking away of a relatively large portion of the tooth from the incisal and side wall surfaces thereof comprising a side wall forming plate inset in the cavity adjacent the base thereof and conforming to the normal side wall contour of the tooth portion that has broken away, a reinforcing mesh secured to the bottom of the side wall forming plate and extending inwardly forming a lining over at least a portion of the cavity, a load distributing anchor extending through the mesh and fastened to the tooth, and a dental filling of hardened plastic material filling the remainder of said cavity and shaped to conform to the normal contour of the natural tooth portion which it occupies.

3,831,282
TUBULAR KEY DECODER

Morris Falk, Palm Springs, Calif., assignor to Fort Lock Corporation, Chicago, Ill.

Filed Jan. 22, 1973, Ser. No. 325,239
Int. Cl. G01b *3/28*
U.S. Cl. 33—169 B 12 Claims

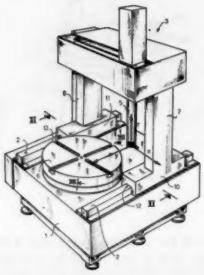


Apparatus for determining and decoding the length of axially directed cuts about the periphery of tubular keys for axial pin tumbler locks wherein the key to be decoded is held on a rotatable spindle which may be moved to the corresponding positions of the key cuts and an axially shiftable radially directed probe is set at the upper end of the cut to be determined. A handle porton is rotated relative to the probe and key with cooperating incrementally spaced abutments and a stop providing both a visual and positive indication of the axial length of cut being measured.

3,831,283
PRECISION MEASURING APPARATUS WITH GUIDES IN PNEUMOSTATIC BEARINGS

Elio Pagella, and Carlo Guerci, both of Ivrea, Italy, assignors to Ing. C. Olivertti & Co., S.p.A., Ivrea (Torino), Italy

Filed July 7, 1972, Ser. No. 269,908
Claims priority, application Italy, July 9, 1971, 69339/71
Int. Cl. G01b 5/00
U.S. Cl. 33—174 R 10 Claims



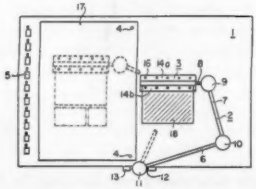
A measuring apparatus comprises a portal formed by uprights spanned by a cross-piece and slidable on guides of a base by means of pneumostatically supported bearings, a slide carrying a feeler and slidable on guides of the cross-piece by means of pneumostatically supported bearings, at least one pressure regulator arranged to regulate the pressure of the air passing through it to one or more bearings and co-operating with a cam to produce a relative movement of the regulator with respect to the cam during the shifting of the slide or the uprights with respect to the cross-piece or the base.

The feeler is carried by an arm slidable in the slide, substantially in the form of an isosceles trapezoid, pneumostatically supported bearings being arranged between the slide and the larger face and between the slide and the inclined faces of the arm.

3,831,284
METHOD AND ARRANGEMENT FOR STRIPPING TEXT AND ILLUSTRATION FOILS

Hartvig Soe, Alvsjo, Sweden, assignor to Misomex Aktiebolag, Hagersten, Sweden

Filed Oct. 8, 1970, Ser. No. 79,175
Claims priority, application Sweden, Oct. 24, 1969, 14612/69
Int. Cl. B41b 1/00
U.S. Cl. 33—184.5 7 Claims

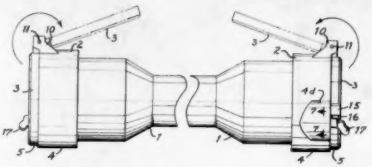


An apparatus is provided for mounting text or illustration film foils, and, in particular, part-color film foils of color separated color pictures, onto a number of strip foils so that various part-color film foils of the same picture accurately register with one another. The apparatus includes a mounting table on which the strip foil is precisely positioned and mounting arm for mounting a film foil to be attached to the strip foil in a desired position thereon. The mounting arm is universally movable in a horizontal plane, lockable in a position in that plane, and pivotable with respect to the table, such that a further film foil can be mounted in precisely the same position on the strip foil as the previous film foil.

3,831,285
LENS COVER AND OPERATING BUTTON ASSEMBLY

Ellin D. Vissing, Idaho Falls, Idaho, assignor to Butler Creek Company, Jackson, Wyo.

Filed Feb. 23, 1973, Ser. No. 335,242
Int. Cl. G02b 23/16; F41g 11/00
U.S. Cl. 33—244 2 Claims

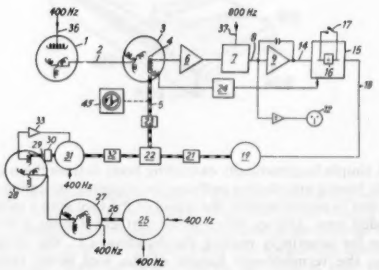


A lens cover for the lens of a telescope embodies a collar of polyethylene having a high degree of flexibility which is mounted over the end of the telescope. The collar has a melting point of about 300° F. The collar has ears integral therewith and a pivot pin on which a stiff lid is pivoted. The collar has an interior annular shoulder, an exterior shoulder, and a shallow annular extension beyond the exterior shoulder over which the lid snaps, the extension and shoulder having a cooperating rib and groove to hold the lid closed. The collar has a thickened portion spaced circumferenctially of the collar from the ears. An operating button and lever unit of another synthetic resin product (DuPont Zytel 101) having a melting point of 700° F is coated with a mold release material and molded in the thickened portion of the collar and has an extension projecting above the exterior shoulder for operating the lever. The material of the enlargement fills into a central aperture of the lever to provide a pivot for it.

3,831,286
NAVIGATIONAL APPARATUS

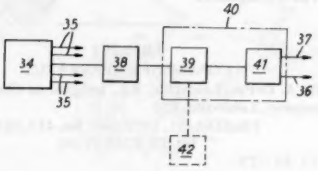
David Eustace Conibear, Crowthorne, and Maurice Vernon Halls, Wokingham, both of England, assignors to Sperry Rand Limited, London, England

Filed June 11, 1973, Ser. No. 368,894
Claims priority, application Great Britain, June 15, 1972, 28166/72
Int. Cl. G08g 5/00
U.S. Cl. 33—317 R 11 Claims



The invention provides navigational apparatus in which the power supply for a detector measuring the magnetic heading

of the vehicle to which the apparatus is fitted, is effectively isolated from the power supply for other components of the apparatus and is stabilised with the result that the overall accuracy of the apparatus is improved considerably even though the power supply for said other components may be relatively unstable. A preferred arrangement comprises gyroscopic means operable to detect changes in heading of the vehicle and produce an electrical output signal in accordance therewith, drive means operable to drive a shaft of a heading indicator in response to the output signal from the gyroscopic means, a detector operable to measure the magnetic heading of the vehicle and to produce an A.C. output signal in accordance therewith, a demodulator operable to produce a D.C. output signal from the A.C. output signal of the detector, logic circuitry to produce a pulsed output signal in response to the D.C. output signal from the demodulator, and a stepper motor to which is applied the pulsed output signal from the logic circuitry and which drives the shaft of the heading indicator to compensate the latter for changes in the magnetic heading of the vehicle, electrical power for the detector and the demodulator being derived from a first stablized A.C. supply which is effectively voltage and frequency independent of a second A.C. supply for at least the gyroscopic device and the drive means.



3,831,287

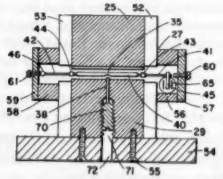
APPARATUS WITH ADJUSTABLE PERIOD FOR MEASURING SMALL DEVIATIONS FROM A TRUE HORIZONTAL PLANE

Richard M. Sawdo, Stow, and Ivan Simon, Belmont, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Feb. 26, 1973, Ser. No. 335,557

Int. Cl. G01c 9/00

U.S. Cl. 33—344 **8 Claims**



An apparatus adapted continuously to measure and record small deviations from a true horizontal plane such as those deviations which may occur continuously or recurrently as a result of ground motion and the like. The apparatus comprises a diamagnetic body suspended in a magnetic field of a configuration which constrains the body radially but permits it to move axially within certain limits. The amount of axial movement is used as a measure of horizontal deviation. The suspension is frictionless, and the apparatus may be made to be relatively rugged and stable over extended periods of time. Adjustable magnetic force restoring means are provided to change and control the natural period of the instrument to optimize it performance over a wide range of applied force.

3,831,288

DRYING AND STERILISING APPARATUS

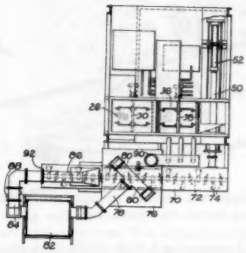
John Brian Stribling, Sutton Coldfield, and Robert Arthur Booth, Stone, both of England, assignors to Lucas Furnace Development Limited, Wednesbury, Stafford, England

Filed Nov. 23, 1971, Ser. No. 201,377

Claims priority, application Great Britain, Nov. 24, 1970, 55708/70; Jan. 2, 1971, 190/71

Int. Cl. F26b 3/34

U.S. Cl. 34—1 **5 Claims**



The invention is concerned with processing chicken etc. excrete to make cattle food or fertiliser. The excreta is mixed with water to produce a slurry and even out variations in the material utilised, and the slurry is thickened to a sludge and then to a solid, which is fragmented and passed through a micro-wave radiation dryer and steriliser: the liquid expressed in thickening is recycled, and steam evolved in sterilising is likewise recycled.

3,831,289

INK DRYING REFLECTOR SYSTEM

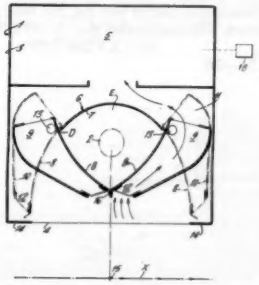
Ronald Edward Knight, Maidenhead, England, assignor to Hanovia Lamps Limited, Buckinghamshire, England

Filed July 17, 1972, Ser. No. 272,644

Claims priority, application Great Britain, July 16, 1971, 33500/71

Int. Cl. F26b 3/28

U.S. Cl. 34—4 **10 Claims**



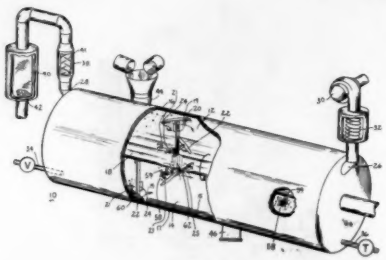
The invention relates to a radiator in which there is an elliptical reflector, part of which is formed by two spaced apart plates forming ducting, the ducting being pivotable from a first, open, position to a second position in which the radiation from the radiator is cut-off, cooling fluid being drawn through the ducting to cool the reflector.

3,831,290

METHOD AND APPARATUS FOR PROCESSING HIGH NITRILE POLYMERS

I. Luis Gomez, Longmeadow, Mass., and Samuel Steingiser, Bloomfield, Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 11, 1971, Ser. No. 197,766
Int. Cl. F26b 7/00
U.S. Cl. 34—12 8 Claims



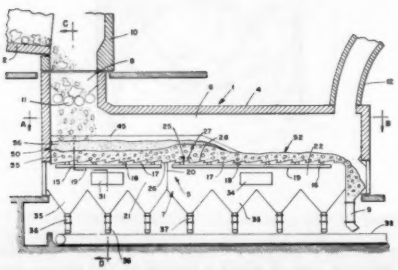
A method of preparing a high nitrile molding resin for conversion into articles for packaging environmentally sensitive materials which involves mixing a moisture-containing batch of such resin having a relatively broad particle size distribution range within a stationary, heated processing chamber without mastication and without subjecting the particles to any substantial back pressure, the major constituent of such resin being a polymerized monomer selected from the group consisting of acrylonitrile, methacrylonitrile and mixtures thereof, and forcing low pressure gas through the chamber while the mixing continues, to purge the vaporized moisture and entrain a fines portion of the particles out of the chamber. In a preferred form of mixing, continuously rotating plows force portions of the particles upwardly along and in contact with the heated chamber surface in a converging mixing pattern while other portions are diverted out of such a pattern by means of plates rotating with the plows so as to increase the exposed surface area of individual particles.

3,831,291

METHOD AND APPARATUS FOR TREATMENT OF PARTICULATE MATERIAL

Karl-Heinz Kayatz, Hamburg-Niestedten, Germany, assignor to Fuller Company, Catasauqua, Pa.

Continuation-in-part of Ser. No. 281,088, Aug. 16, 1972, abandoned. This application Nov. 3, 1972, Ser. No. 303,669
Int. Cl. F26b 7/00
U.S. Cl. 34—20 5 Claims



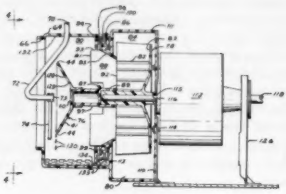
A method and apparatus for heat treating particulate materials such as the cooling of cement clinker discharged from a rotary kiln. The cooler includes a hot material inlet and a cool material outlet with a reciprocating grate conveyor for supporting a bed of material within the cooler and transporting the material from the inlet to the outlet. A plenum chamber is defined below the conveyor and air is supplied to the chamber for passage through the conveyor and bed of material to cool the material. The cooler includes a first, narrow section which establishes a deep bed of material. High pressure air is passed through this deep bed of material so that a lower layer of coarse material and an upper layer of fine material is established. The first section is followed by a transition section through which no air is passed. The transition section is followed by a second, wider section through which low pressure air is passed. In the second section, a shallow bed of material is established.

3,831,292

CONDENSER APPARATUS

Laddie A. DePas, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 31, 1973, Ser. No. 411,363
Int. Cl. F26b 21/06
U.S. Cl. 34—75 8 Claims



Condenser apparatus for removing moisture from the air including a housing for the condenser apparatus, which housing has both a cooling liquid inlet and an air inlet at one end. Within the housing is a rotatable disc spaced inwardly from the liquid inlet so that when the disc is rotated and liquid is impinged upon the disc a cooling liquid droplet cloud is produced. At the opposite end of the condenser housing from the inlet is an air outlet and a concentrically positioned rotatable blower. Located between the blower and the rotatable disc is a rotatable liquid droplet interceptor wheel for collecting entrained liquid droplets before they pass into the blower. Circumferentially around the interceptor wheel is a tangential turbine liquid pump that removes liquid from the condenser apparatus. An electric motor is utilized for rotatably driving all of the rotating elements. The condenser apparatus is utilized particularly in an automatic clothes dryer wherein hot moisture-laden air that has been passed over the fabrics to be dried is introduced into the condenser apparatus which reduces the temperature of the air to condense moisture therefrom and then recirculating the air again through the clothes dryer.

3,831,293

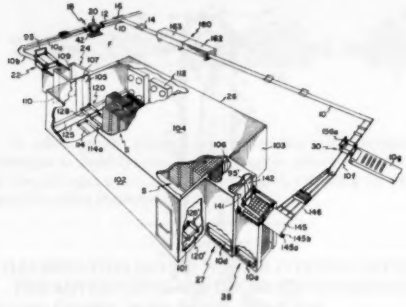
STACKED TRAY PROCESSING AND FREEZING SYSTEM

Charles E. Ingram, Freeland; Roger J. Gendron, Bridgeport; Vern V. Cronk, Hemlock, and Harry J. Keefe, Saginaw, all of Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Sept. 15, 1972, Ser. No. 289,241
Int. Cl. F26b 19/00
U.S. Cl. 34—236 20 Claims

A system for processing products such as food products, and more particularly comprising apparatus for loading food products into trays and for stacking the food carrying trays in vertically nested, individual stacks. The system includes ap-

paratus for moving the stacks through a temperature controlled anteroom into a freezing chamber and a plurality of individually operable conveyor beds in the freezing chamber are provided for selectively receiving the stacks, storing the stacks for different selected processing times, and discharging the stacks. Apparatus is provided for receiving a stack of trays from any selected conveyor bed and removing it from the



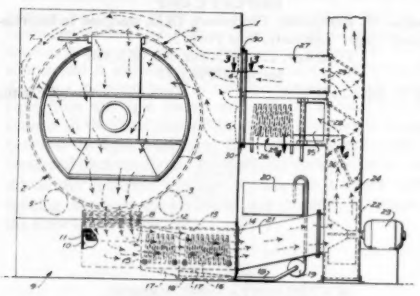
freezing chamber through a temperature controlled discharge anteroom. The system also includes apparatus for unstacking the stacks of discharged, frozen food carrying trays, and apparatus for unloading the product from the trays downstream of the unstacking apparatus. The unloaded trays are cleaned and returned to the loading apparatus to be reloaded with unfrozen food products.

3,831,294

MEANS FOR CONTROLLING THE DRYING OF TEXTILES AND RECLAIMING THE LIQUID THEREFROM

Benjamin H. Freze, Garden Grove, Calif., assignor to Challenge-Cook Bros., Incorporated, Industry, Calif.

Filed Sept. 11, 1972, Ser. No. 287,688
Int. Cl. F26b *11/02*
U.S. Cl. 34—131 **5 Claims**



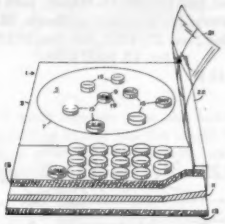
A means for controlling the drying of textiles which contains a cleaning solvent or a mixture of cleaning solvent and water, the textiles being placed in a rotatable tumbling drum, then subjected to air maintained below atmospheric pressure, the air passing through the drum and subsequently through cooling units which condense the vapor removed by the air. Means are provided for varying the drying procedure such as heating the air; recirculating and reheating a preselected portion of the air; recirculating selected portions of the air without heating; introducing ambient air; and controlling the total volume of the air.

3,831,295

POINT-VECTOR CONCEPT ASSESSMENT METHOD AND APPARATUS

George R. MacKay, 575 Holly Ln., Paradise, Calif. 95969

Filed Oct. 4, 1971, Ser. No. 186,071
Int. Cl. G09b *1/08*
U.S. Cl. 35—22 R **3 Claims**



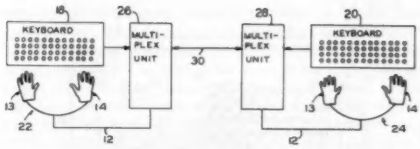
A point-vector morphogenic method and apparatus for the objective recording and assessment of verbal and non-verbal mental processes and concepts. The apparatus includes a plurality of open system semantic vehicles and containment field adapted for the assessment of concepts and their infinite combinations relative to a given concept and each other. The open system principle permits the subject or the assessor to personalize a program by adding new relevant semantic vehicles of his choice within the field at select positions. The containment field structure includes a central reference point or nucleus representative of the concept to be examined and is adapted to receive said semantic vehicles relative to said central point. Each of the said semantic vehicles carries a defining concept. The semantic vehicles are adapted for placement within said containment field at any point relative to said nucleus as selected by the subject such that said markers individually and in combination establish a point-vector pattern. The apparatus is so adapted that all possible program assessments may be performed by the subject individual within the bounds of the containment field in relationship to the central nucleus.

3,831,296

ALPHANUMERIC TACTILE INFORMATION COMMUNICATION SYSTEM

Edward D. Hagle, 2338 Agate St., Eugene, Oreg. 97403

Filed Aug. 2, 1972, Ser. No. 277,384
Int. Cl. G09b *21/04*
U.S. Cl. 35—35 A **5 Claims**



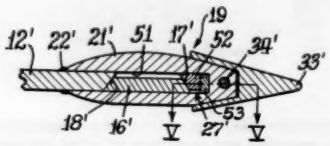
A method and system for communicating with the blind and deaf person produces a sequence of electrical impulses corresponding to the characters on a typewriter keyboard. The impulses are employed to selectively actuate corresponding stimulators positioned on a surface areas of the handicapped person's body and arranged generally in the pattern of such keyboard. Each stimulator, upon being actuated, stimulates a portion of such area of skin corresponding to the character of

the keyboard. A specific example of apparatus employed in the above method and system includes a typewriter terminal connected to a pair of gloves having a plurality of stimulators embedded therein.

3,831,297
REPLACEABLE CUTTING EDGE ASSEMBLY WITH WEDGE MEANS

William E. Lanz, and Eugene M. Wilson, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 27, 1973, Ser. No. 373,999
Int. Cl. E02f 9/28
U.S. Cl. 37—141 R 7 Claims

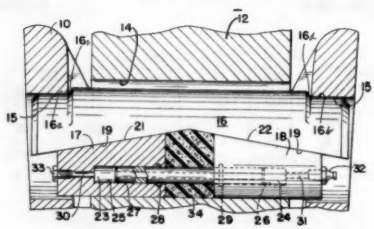


A cutting edge assembly including an elongated member with a cutting edge arranged upon a leading edge of a material handling implement, the elongated member being firmly secured in place by a plurality of retainers, each of the retainers including an adapter secured to the implement, the adapter having a surface spaced apart from the cutting edge with two embodiments of wedge assemblies being disclosed for arrangement in the space between the adapter surface and cutting edge to secure the elongated member against the leading edge of the implement.

3,831,298
EXPANDABLE RETAINING PIN FOR TELESCOPIC PARTS

Eugene L. Helton, and Loyal O. Watts, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 23, 1973, Ser. No. 362,916
Int. Cl. E02f 9/28
U.S. Cl. 37—142 A 7 Claims

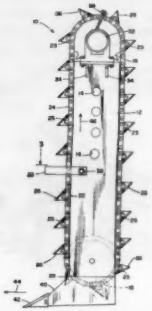


An expandable retaining pin to fit within coaxial bores formed through two telescopic members, comprising a cylindrical element provided with a chamber for receiving pressurized fluid and means responsive to the pressurized fluid for expanding the pin radially and urging it into tight engagement with opposite walls of the respective bores.

3,831,299
CABLE LAYING PLOW EQUIPPED WITH A CUTTING CHAIN

Leon O. Kelley, P.O. Box 488, Stamford, Tex. 79553

Filed Sept. 28, 1972, Ser. No. 292,898
Int. Cl. E02f 3/10, 5/06
U.S. Cl. 37—191 A 1 Claim

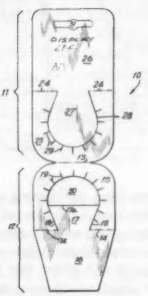


A cable laying plow includes a plow shank having a vertically extending forward edge. Sprockets are positioned at the upper and lower ends of the plow shank and a roller chain is supported on the sprockets for movement around a course including a portion extending along the forward edge of the plow shank. Knife blades are mounted at spaced intervals on the chain, and a stationary cutter bar extends forwardly from the plow shank for cooperation with the knife blades on the chain to effect cutting. A hydraulic motor is mounted on the upper end of the plow shank and drives the chain through the upper sprocket. A plow toe is mounted at the lower end of the plow shank and surrounds the lower sprocket for the protection thereof. The plow toe extends forwardly to a detachable point located substantially forwardly of the forward edge of the plow shank.

3,831,300
DISPLAY CARD

Thomas W. Berkhouse, Cincinnati, Ohio, assignor to International Paper Company, New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,396
Int. Cl. G09f 3/14
U.S. Cl. 40—21 B 9 Claims



Disclosed is an interlocking display card for mounting on the neck of a bottle and the blank therefor.

3,831,301
PHOTOGRAPH ALBUM PAGE

John M. Reynard, Framingham, Mass., assignor to Polaroid Corporation, Cambrigde, Mass.

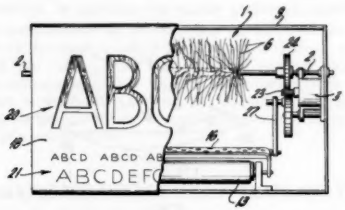
Filed Dec. 29, 1972, Ser. No. 319,227
Int. Cl. B42f 9/00; G09f 1/12
U.S. Cl. 40—104.18 4 Claims

A photograph album page providing rails containing passages to slidably receive photographic prints, a constriction in the passages positioning and releasably retaining the photographic prints mounted on the page.

3,831,302
ILLUMINATION DEVICE WITH GLITTERING EFFECT FOR ADVERTIZING AND DECORATIVE PURPOSES

Augusto Gentilini, 36 Via dei Mille, Rome, Italy

Filed July 25, 1972, Ser. No. 274,889
Claims priority, application Italy, July 29, 1971, 51985/71
Int. Cl. G09f 13/36
U.S. Cl. 40—106.52 9 Claims



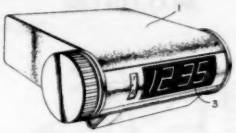
An illumination device comprises a housing having a front viewing wall of transparent or semi-transparent material and having an interior wall with a reflective surface behind a light source. A rotatable member is mounted adjacent to the light source and it includes a plurality of radially extending light deviating members such as metallic laminar, which receives light from the light source and reflects at least a portion thereof to the front face of the device. A screen is mounted between the light source and the rotatable member and it is oscillated backwardly and forwardly by the same motor which drives the rotatable member in order to produce various lighting effects on the rotatable light deviating members and the front viewing wall.

3,831,303
SYMBOL INDICATION DEVICE

Takashi Funaki, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Suwa-gun, Nagano-ken, Japan

Filed Aug. 31, 1972, Ser. No. 285,433
Claims priority, application Japan, Nov. 18, 1971, 46-91904; Dec. 25, 1971, 47-1066; Jan. 14, 1972, 47-5863; Jan. 14, 1972, 47-5864; Jan. 28, 1972, 47-9803; Sept. 2, 1971, 46-78885
Int. Cl. G09f 11/00
U.S. Cl. 40—28 C 11 Claims

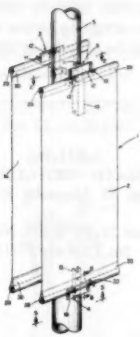
A device comprising a mask plate having formed therein at least one symbol indication window comprising at least one relatively narrow and elongated quadrilateral slot or slit and having an inclined base line, a symbol indicator having at least one series of symbol patterns printed or otherwise superposed thereon, and symbol indicator drive means. The symbol indicator drive means intermittently drives and moves the symbol indicator in such manner that the latter is moved a distance corresponding to one half the length of each symbol pattern each time it is driven, whereby one symbol after another can be indicated through the symbol indication window.



3,831,304
POLE BANNER SIGN CONSTRUCTION

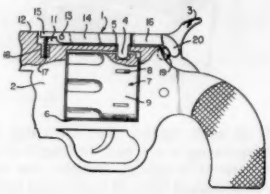
Wendell V. Miller, and Thomas Friedrichsen, both of Massillon, Ohio, assignors to The Massillon-Cleveland Akron Sign Company, Massillon, Ohio

Filed Aug. 24, 1972, Ser. No. 283,565
Int. Cl. G09f 07/18, 17/00
U.S. Cl. 40—125 G 3 Claims



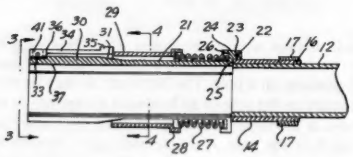
A pole banner sign construction which has rugged permanent hardware for supporting a flexible banner generally in a fixed position on a pole. The hardware all may be mounted permanently on the pole or all hardware except simple mounting plates at the upper and lower ends of the banner may be removed from the pole. A simple rectangular flexible banner is supported under tension on the hardware and is adapted to be folded into a small package for shipment in an envelope. Rigid pull rods are located in the hems at the upper and lower edges of the flexible banner. The hardware support means at the upper and lower ends of the flexible banner holds the pull rods in parallelism and maintains longitudinal tensional pull on the flexible banner between the rigid parallel pull rods. The hardware in maintaining the pull rod parallelism under tension also holds the pull rods against pivotal movement on, or twisting and turning movement about, the pole. The flexibe banner conceals the hardware behind the banner when the banner is mounted on the pole. A pair of flexible banners may be mounted in the same way on opposite sides of the pole, any banner may be changed from time to time without the use of any tools merely by unhooking several hooks from banner engagement, then transferring pull rods from an initial banner to a replacement banner, and then hooking the replacement banner in place.

3,831,305
REVOLVER CYLINDER LOCK
Richard J. Casull, 3270 Del Mar Dr., Salt Lake City, Utah 84109
Filed May 31, 1973, Ser. No. 365,638
Int. Cl. F41c 1/00
U.S. Cl. 42—67 8 Claims



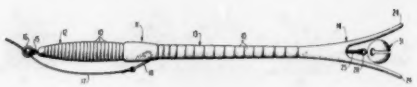
A lock bar is pivotally attached to the revolver frame and includes a finger normally spring-urged into locking engagement within a detent in the revolver cylinder. Actuating means on the hammer provides a pair of camming surfaces alternately engageable with the lock bar whereby, upon cocking of the hammer, a first camming surface vertically displaces the lock bar to momentarily extract the finger from the cylinder detent and when the hammer returns to its forwardmost position, a second camming surface laterally deflects the lock bar to allow passage of the actuating means without disturbing the finger engaged within the cylinder detent.

3,831,306
AUTOMATIC SHOTGUN CHOKE
Woodrow W. Gregg, 55 Magnolia Ave., Jersey City, N.J. 07306
Filed June 29, 1973, Ser. No. 375,127
Int. Cl. F41c 21/18
U.S. Cl. 42—79 7 Claims



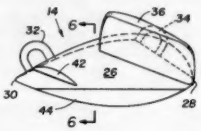
A choke attachment for a shotgun barrel to automatically provide an extension of the bore of the barrel upon firing the first round from the shotgun. The attachment consists of a collar clamped on the shotgun barrel and having pivoted barrel segments with outer cam surfaces engagable by a camming sleeve surrounding the segments and urged forwardly by a coiled spring. The camming sleeve is normally held in a rearward position against the force of the coiled spring by detent arms pivoted to the segments which are triggered outwardly by the expansive force produced by the first round fired by the shotgun. The spring then acts on the camming sleeve to force the segments inwardly to define an extension of the shotgun bore and thus provide the desired choke action for subsequent shots.

3,831,307
FISH LURE WITH FISH ATTRACTING RATTLE
Gloucester R. Pittman, 623 N. Stone Mountain-Lithonia Rd., Rt. 3, Stone Mountain, Ga. 30083
Filed July 17, 1973, Ser. No. 379,992
Int. Cl. A01k 85/00
U.S. Cl. 43—42.31 10 Claims



A fish lure for attracting fish by emitted sound wherein the sound comes from a rattle mechanism attached to the artificial bait body. The rattle is either a hard hollow container having loosely disposed balls therein to effect the noise, or it may be a conventional bell with a clacker. Anchor means are attached within the bait body to maintain the rattle firmly attached. Other parts of the lure are also attached by the disclosed anchor means.

3,831,308
FISHING LINE ATTACHMENT
Avey Shaw, 52 Leed St., Huntington Station, N.Y. 11746
Filed Sept. 7, 1972, Ser. No. 286,580
Int. Cl. A01k 91/02, 95/00
U.S. Cl. 43—43.13 5 Claims



A fishing line attachment having a longitudinally extending body and which in one orientation causes surfacing movement and an opposite orientation diving movement. The attachment is thus selectively advantageously used during trolling and casting to properly position the terminal or fishing end of the line during said fishing activities. It also has utility as a lure and sinker. The body has two pairs of spaced-apart wings mounted thereon which extend outward from and beyond opposite sides of the body. Each wing has first and second edge portions which cause the reversible motion in response to line tension.

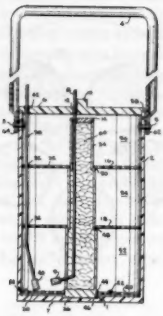
3,831,309
FISHING LEADER
Leon L. Martuch, Midland, Mich., assignor to Scientific Anglers, Inc., Midland, Mich.
Filed June 1, 1972, Ser. No. 258,631
Int. Cl. A01k 91/00
U.S. Cl. 43—44.98 10 Claims

A fly fishing leader having a loop at the tippet end of the butt section on which different diameter tippet sections can be tied.

3,831,310
LIVE BAIT BUCKET

George C. Frangullie, P.O. Box 950, Port Lavaca, Tex. 77979

Filed Mar. 8, 1973, Ser. No. 339,312
Int. Cl. A01k 97/04
U.S. Cl. 43—56 5 Claims

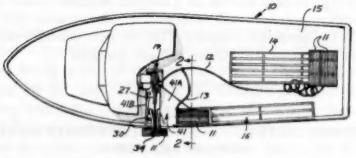


To keep live bait from clustering together and thus shortening their lives, the bait bucket is divided into a number of bait storage compartments by means of spacers or partitions. The spacers preferably are perforated with a number of fluid-flow passages which are large enough to permit the flow of water, but are too small to permit the bait itself from passing between compartments. In addition, the bucket preferably includes a thermal compartment to provide some control over the temperature of the water in which the live bait is carried, a compartment that may be filled with ice in hot weather when the ambient temperature is low. An optional feature is an air stone or aerator in the bottom of the bait compartments, together with appropriate air tubing or passageways adapted for connection to a source of air.

3,831,311
APPARATUS FOR USE IN HAULING TRAPS AND THE LIKE

Lloyd C. Cushing, 5 Chester Ave., Falmouth, Maine 04105

Filed Dec. 13, 1972, Ser. No. 314,592
Int. Cl. A01k 81/04
U.S. Cl. 43—6.5 11 Claims

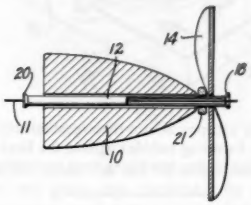


Apparatus is disclosed for use in hauling lobster traps and includes a platform mounted in the ship between a trap line hauler and the side of the ship over which the traps are to be lifted. The platform has fore and aft sections spaced to provide a pathway for a pivoted lifting arm swung by a ram between first and second positions. The arm has a sheave over which the trap line is trained. In the first position of the arm, the sheave is outboard so that a trap hauled to the surface is lifted over the side as the ram swings the arm towards its second position as the line is pulled by the hauler until the trap is deposited on the platform. In the second position of the arm, it is below the platform and the trap is free of its sheave. The platform is a ramp downwardly inclined so that a freed trap can slide or be easily moved to a service station located aft of the apparatus.

3,831,312
FISH LURE

John E. Pope, Wilmington, and Jack H. Main, Santa Monica, both of Calif., assignors to Pope Manufacturing, Inc., Valencia, Calif.

Filed Mar. 24, 1972, Ser. No. 237,623
Int. Cl. A01k 85/00
U.S. Cl. 43—42.17 6 Claims

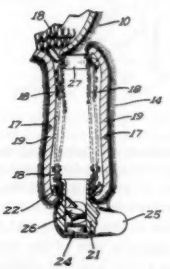


A fish lure having one or more attractor elements movably attached on a sliding body such as a sinker. An attractor element is positioned on a mounting tube substantially coaxial with the sliding body for rotary, pivotal, and/or vibratory movement relative to the sliding body without interfering with the longitudinal motion of the sliding body along a fishing line.

3,831,313
STUFFED DOLL AND COIN BANK

Helen J. Cichy, 2616 Huntington Ave., Minneapolis, Minn. 55416

Filed Apr. 13, 1972, Ser. No. 243,566
Int. Cl. A63h 3/02
U.S. Cl. 46—2 1 Claim



A doll stuffed with realtively stiff fibers or filaments formed into mesh or net like material that is yielding but also has some stiffness. Two layers of the net or mesh formed into a tube will hold an extremity of the doll in shape while leaving the center of the limb open to serve as a bank.

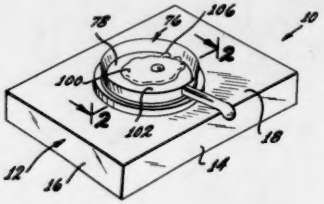
3,831,314
PNEUMATIC TOY STOVE ACCESSORY

Sidney Bass, Los Angeles, and Hubert A. Rich, Westminster, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sept. 26, 1973, Ser. No. 400,771
Int. Cl. A63h 33/30
U.S. Cl. 46—14 5 Claims

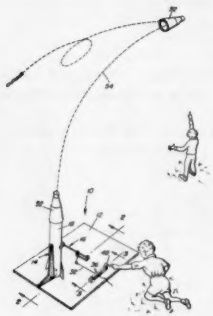
Air is directed up through a sparger ring in a pan having a thin, flexible food-simulating member lying on the sparger ring

and having its edges sealed with water. Air is trapped under food-simulating member until fluid pressure overcomes the



seal and a bubble escapes. Seal is then reestablished until next bubble escapes. Escaping bubbles agitate the food-simulating member and water to simulate frying food in cooking oil.

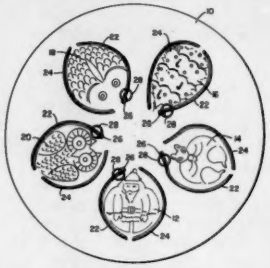
3,831,315
TOY ROCKET LAUNCHING SYSTEM
Bertram C. Gilbert, 4535 Butler St., Fort Meade, Md. 20755
Filed Aug. 10, 1973, Ser. No. 387,302
Int. Cl. A63h *27/00*
U.S. Cl. 46—74 B **13 Claims**



An elongated balloon is inflated and the open end is twisted and positioned over an upstanding peg fixedly secured to a flat launching platform. A lever, attached for pivotal movement to the platform, is pressed into engagement with an intermediate portion of one side of the balloon and held in this position. This presses the opposite side of the intermediate portion of the balloon against a back support which is secured to and extends upwardly from the platform to thereby capture and hold the balloon in an upright position. A plastic space capsule is positioned over the upper end of the held balloon and the lever is released. The pressurized air escapes from the open end of the balloon forcing it upwardly from the launching platform, ultimately the balloon deflates and separates from the launched capsule.

3,831,316
MULTI-FIGURE ZIPPER TOY BAG
Elizabeth N. Weistrop, 505 Dolores Ave., Half Moon Bay, Calif.
Filed June 14, 1973, Ser. No. 370,130
Int. Cl. A63h *3/12*
U.S. Cl. 46—153 **8 Claims**

A children's toy comprising a plurality of selectably interchangeable figure images disposed on a common piece of fabric or similar pliant material. Each of the figure images has at least one pair of mating zipper tracks disposed along opposite portions of the image periphery. Any one of the available figure images may be developed into a corresponding three-dimensional figure form by gathering the material exterior of the selected image so as to be enveloped within the selected image and capturing it therein by engagement of the

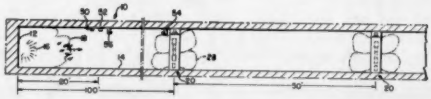


confronting zipper tracks to form a bag with the selected image on the exterior surface. Figures having more complex shapes can be formed by using multiple zippers and preformed body members attached to the base material. The available figure images may be chosen so that the sequence of figure formation by the child may correspond, for example, to the development of a story or to some natural phenomenon.

3,831,317
AGRICULTURAL SUBSTRATES
Pierre Porte, Sainte-Foy-Les-Lyon, France, assignor to Societe Rhodiaceta, Paris, France
Continuation-in-part of Ser. No. 86,294, Nov. 2, 1970, abandoned. This application Mar. 29, 1973, Ser. No. 346,149
Claims priority, application France, Nov. 14, 1969, 69.39182
Int. Cl. A01g *9/00, 31/00*
U.S. Cl. 47—58 **7 Claims**

A synthetic culture medium comprising a polymeric material having an apparent density of 0.01 and 0.5 and a specific surface area of between 2 and 25 m^2/g, the polymeric material being in the form of an amorphous fibril. Such polymeric materials include thermoplastic polymers such as film-forming linear super polyamides, film-forming polyesters, vinly polymers, acrylonitrile base polymers, and polyolefins, the fibrils being suitable for use as a culture medium either alone or in combination with soil, sand and the like so as to provide a more readily aeratable mixture. Plant growth is improved by a process utilizing such synthetic culture medium.

3,831,318
EXPLOSION DETECTION AND SUPPRESSION METHOD AND APPARATUS
J. Kenneth Richmond, Pittsburgh, Pa., assignor to Rocket Research Corporation, Redmond, Wash.
Filed May 8, 1972, Ser. No. 251,079
Int. Cl. E05f *15/20*
U.S. Cl. 49—31 **20 Claims**



In a coal mine passage, a plurality of stored bags which can be rapidly inflated with an inflating medium having a com-

bustion suppressing agent to form a barrier to the propagation of a combustion reaction of a fuel-air mixture, such as a mixture of coal dust and/or methane and air. To detect an incipient propagating combustion reaction, there is a radiation sensor, a static pressure sensor and a dynamic pressure sensor. There is a data analysis computer comprising a discriminator which determines a condition where radiation is above a certain predetermined level, and static and dynamic pressure are below a predetermined level within an initial short time period (e.g. 0.15 seconds) of sensing such increased radiation. When such a condition exists, the discriminating means arms an activating means which inflates the barrier bags in response to a predetermined level of increase of any one of the following five values: static pressure, dynamic pressure, rate of dynamic air pressure increase, rate of static pressure increase, and rate of radiation increase. Thus the apparatus discriminates between an actual condition of a possible rapidly propagating combustion reaction and such other disturbances as a stationary flame, electrical spark or a blast wave that do not result in such reaction. By initially containing the combustion suppressing medium in an inflatable, a more effective barrier is formed.

3,831,319

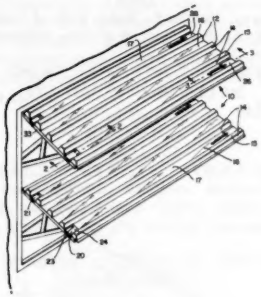
AWNING-STORM SHUTTER AND SPRING CLIP ATTACHMENT MEANS

Frederick Eugene Warner, 990 N.W. 13th Ter., Fort Lauderdale, Fla. 33311

Filed Apr. 10, 1973, Ser. No. 349,688

Int. Cl. E06b *1/34, 3/30*

U.S. Cl. 49—62 **11 Claims**



An anti-glare translucent weather shield for awning type windows provided with quick attachable clip means. The shield being made of corrugated plastic sheet and when attached by the clip means to the window units serving as an awning when the window is open or as a storm shutter when the window is closed. Also, the shield is molded with glass fibers for reinforcement and tested on each side to support predetermined loads imposed on it during hurricanes and the like when attached to a window as a storm shutter.

3,831,320

APPARATUS FOR CONNECTING THE GUIDE TUBE OF A CABLE WINDOW WINDER TO A CENTRAL GUIDE RAIL

Hans Dauernheim, Sprendlingen, and Horst Jander, Heusenstamm, both of Germany, assignors to H. T. Golde GmbH, Frankfurt(Main), Germany

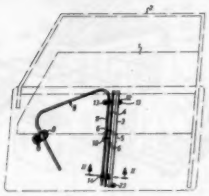
Filed Apr. 18, 1973, Ser. No. 352,222

Claims priority, application Germany, Apr. 28, 1972, 2220986

Int. Cl. F05f *11/40;* **B27b** *9/02*

U.S. Cl. 49—352 **10 Claims**

In a slidable window of the type used in automobiles, the window is guided in the open position partially by the window frame and partially by a guide rail located in the window shaft of the automobile door. A cable window winder opens and closes the window and has a guide tube portion arranged in parallel with the guide rail. One end of the guide tube portion



is fixed to the guide rail and its other end is displaceably secured to the guide rail, preferably by a flexible thermoplastic member, so that errors in parallelism or deviations in curvature between the guide rail and the guide tube portion can be compensated.

3,831,321

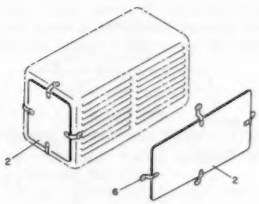
AIR CONDITIONER COVERS

Tage George Johnson, 2442 Meadowbrook Dr., Denver, Colo.

Filed Mar. 5, 1973, Ser. No. 338,077

Int. Cl. E06b *3/32*

U.S. Cl. 49—465 **4 Claims**



A novel and practical means of providing air conditioner units with a protective cover device, is disclosed herein.

The air conditioner covers, which can be furnished in a wide variety of sizes to accomodate units of varying dimensions, are easily and quickly installed, and serve to provide the respective unit with a weather-tight protective cover, during winter months or when the unit is out of service for extended periods.

3,831,322

CONTINUOUS FEED VIBRATORY FINISHING MACHINE WITH DISCHARGE RATE CONTROLLED BY OPERATION OF TUB DISCHARGE CLOSURE

John F. Rampe, Mayfield Heights, Ohio, assignor to Rampe Research, Cleveland, Ohio

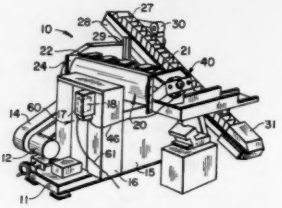
Continuation-in-part of Ser. No. 8,815, Feb. 5, 1970, Pat. No. 3,685,213. This application July 11, 1972, Ser. No. 270,700

Int. Cl. B24b *31/06*

U.S. Cl. 51—163 **19 Claims**

A vibratory finishing machine including a supporting frame, a processing tub, and a tub vibrating mechanism interposed between the frame and the tub. A continuous feed finishing operation is provided by charging the workpieces and media into one end of the tub and discharging them through an opening in the opposite end of the tub. The bottom of the discharge opening extends substantially level with the bottom of the tub thereby providing no obstruction which will cause liquids or other materials to be retained for excessive times within the

tub. A power-operated closure is mounted on the tub for selectively closing and opening the discharge opening. The closure is movable toward and away from the discharge opening along a path generally perpendicular to the opening to control the discharge of materials from the tub, thereby controlling the retention time of the materials in the tub.

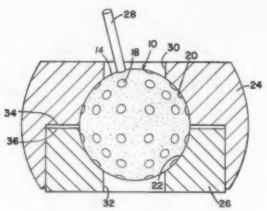


3,831,323

SPERICAL PERMANENT DIAMOND LAP AND METHOD OF USE

Rayburn K. Widner, Arab, and Aubrey Rodgers, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 6, 1973, Ser. No. 413,407
Int. Cl. B24d *15/02*
U.S. Cl. 51—204 **5 Claims**



A spherical diamond lap for producing spherical cavities of gas bearing quality for gyros in which the spherical diamond lap has diamond particles bonded to the outer surface thereof to perform the cutting action of the spherical cavities within the gas bearing gyro. The spherical diamond lap is rotated through particular strokes to cut precision cavities.

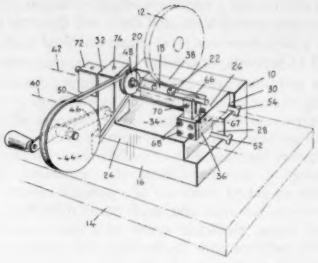
3,831,324

ADJUSTABLE WORK PIECE HOLDER

John Wain, 28 Althea Rd. M6S2P2, Toronto, Ontario, Canada

Filed July 5, 1973, Ser. No. 376,417
Int. Cl. B24b *41/06*
U.S. Cl. 51—237 R **7 Claims**

This invention relates to a work piece holder for holding work pieces of variable lengths during grinding or other operations. A head block carrying a head center and a tail block carrying a tail center are adjustably slidably positioned on a base plate to hold the work piece. The base plate is secured in a conventional manner to a work table to provide for reciprocating motion of the work piece relative to a grinding wheel. The head block and tail block each have a body portion which are respectively located in first and second longitudinally extending steps in the base plate. The head block and tail block are releasably fixed relative to the base plate by anchor bolts which pass through their respective body portions to threadably engage mating anchor nuts located in parallel longitudinally extending slots in the steps of the base plate. The base plate and head and tail blocks are constructed to allow the body portions to laterally pass each other during adjustment to permit a portion of the head and tail blocks to extend beyond the ends of the base plate to hold longer work pieces without requiring a longer base plate. The head center is spring loaded and the tail center is vertically adjustable by a setscrew to permit the workpiece to be ground parallel or tapered.

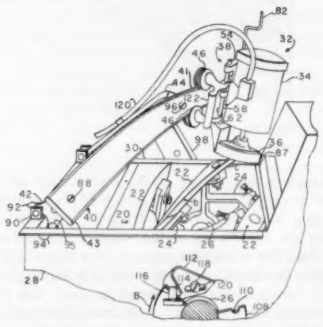


3,831,325

SHARPENING MECHANISM PARTICULARLY IN COMBINATION WITH A FORAGE CHOPPER OR THE LIKE

Marvin L. Joray; Nathan L. Blake, both of Coldwater, and Gerald F. Richards, Celina, all of Ohio, assignors to AVCO Corporation, Coldwater, Ohio

Filed July 2, 1973, Ser. No. 376,054
Int. Cl. B24b *19/00, 3/00, 5/18*
U.S. Cl. 51—249 **16 Claims**

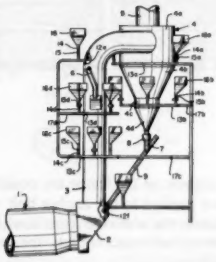


A forage chopper, including a rotary cutter, is provided with a mechanism for sharpening the knives of the cutter. A grinding stone is mounted on a slide which is guided by a helical bar. The helical knives of the cutter are successively locked in a sharpening position in which the grinding stone uniformly removes material from bevel surfaces thereof as the slide is traversed along the helical guide bar to sharpen their helical cutting edges. The grinding stone may be adjusted to vary the amount of material removed from the bevel surfaces of the knives and the guide bar has an extension on which the grinding stone slide is locked in a storage position during normal operation of the forage chopper. A motor spring is connected to the slide to assist an operator in moving the slide along the guide bar.

3,831,326
ABRASION OF CAKING

Gundorph Albertus, Copenhagen-Valby, Denmark, assignor to F. L. Smidth & Co., New York, N.Y.

Division of Ser. No. 807,852, March 17, 1969, Pat. No. 3,726,045. This application Oct. 25, 1972, Ser. No. 300,457
Claims priority, application Great Britain, Mar. 20, 1968, 13455/68
Int. Cl. B24c 1/00
U.S. Cl. 51—320 3 Claims

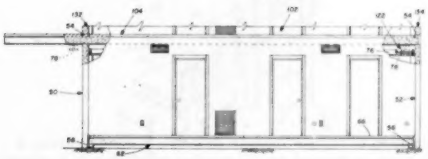


In a system for the manufacture of cement having a preheater for preheating raw material fed to a heated rotary kiln, a method is disclosed for removing caked raw material from internal wall areas of the preheater which are likely to build up such caked material. The method relates to suspending cement clinker particles in a gas moving at a high velocity and causing the gas and particles to impinge upon the wall areas which are normally subject to caking at sufficient velocity to dislodge the caking.

3,831,327
SERVICE CORE INSTALLATION SYSTEM

Raymond Lee McCrillis, Littleton; Richard Hill Dixon, Lakewood, and John Francis Oldani, Litteton, all of Colo., assignors to Marcor Housing Systems, Incorporated, Denver, Colo.

Filed Mar. 1, 1972, Ser. No. 230,832
Int. Cl. E04b 1/35
U.S. Cl. 52—79 9 Claims

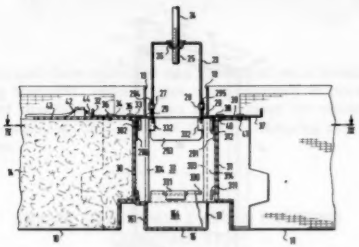


In a dwelling construction system, a multi-story, multi-family building comprises prestressed concrete pallets which are supported between load bearing walls to form the floors and the ceilings of individual dwellings. Each dwelling includes a service core comprising an enclosure formed on one of the pallets and complete mechanicals for the dwelling. The service cores are fabricated by mass production techniques and are subsequently transported to the building site for installation. In some instances the service core comprises a complete dwelling, in which case the enclosure of the service core may form the exterior walls and the roof of the dwelling.

3,831,328
STRUCTURAL UNIT FOR FRAME CONSTRUCTION

Hans Mohr, Paderborn; Peter Weigel, Borchen, and Kurt Metzl, Paderborn, all of Germany, assignors to Nixdorf Computer AG, Paderborn, Germany

Filed Aug. 3, 1973, Ser. No. 385,328
Claims priority, application Germany, Aug. 5, 1972, 2238707
Int. Cl. E04b 5/52
U.S. Cl. 52—145 15 Claims

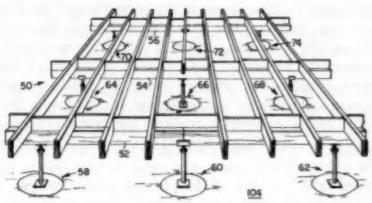


A framing system for supporting false ceilings includes a vertically adjustable suspension member carrying a bracket. Means are provided to mount cross members to the bracket by pushing the cross members from below up into coacting locking means formed on the bracket and the cross members and then moving an arm outwardly from the end of the cross member to rest upon a horizontal bearing surface of the bracket to thereby suspend the cross members from the hanger.

3,831,329
BUILDING CONSTRUCTION SYSTEM

Donald S. Lear, Concord, Calif., assignor to Glen-Crete Products Co., Pleasant Hill, Calif.

Continuation of Ser. No. 799,297, Feb. 14, 1969, abandoned. This application Dec. 30, 1970, Ser. No. 102,940
Int. Cl. E04c 15/00
U.S. Cl. 52—126 9 Claims

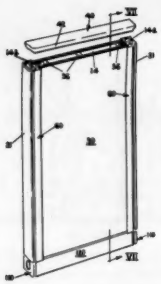


Steel piers are fixed to concrete footings supported by the ground. These piers extend upward from the footings to support the girders of the frame of a house. The piers are adjustable in height so that they may be set to support the girders at proper distance above the ground. Each pier includes a top plate which is nailed to the supported girder. Each pier may be easily adjusted, if necessary, to compensate for subsequent heaving of the ground by readjusting the height of the pier. Selective locking of the adjusting mechanism against accidental retraction by vibration is provided without impeding extensibility under heaving stress.

3,831,330
PANEL SYSTEM

William H. Tacke, Wyoming; Robert B. Ormiston, Grandville, and Robert H. McKay, Grand Rapids, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Division of Ser. No. 234,492, March 14, 1972, Pat. No. 3,802,146. This application July 9, 1973, Ser. No. 377,273
Int. Cl. E04c 2/52
U.S. Cl. 52—220 11 Claims



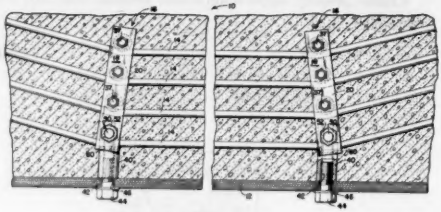
A partition system including a frame to which different types of covering panels can be readily hooked into place. Vertical wiring channels are provided at the end elements of the frame and covers are provided which simultaneously cover the wiring channels and mask the edges of the panel. Brackets for supporting superstructure can be secured to the end elements of the frame in channels which are defined by an end trim piece on one side and by a wall of the wiring channel on the other side. Adjacent partitions can be secured together angularly by means of a single link at the top and a single link at the bottom thereof. They can be secured in alignment by a pair of adjacent links at the top and at the bottom. Vertically spaced platforms can be mounted on feet at the bottom of the partitions to define space wiring channels. Telescoping end caps are provided for covering the ends of the wiring channels and the top portion of each end cap can be telescoped downwardly to allow access to the connecting links at the bottom of the partition. The wiring channels can be covered on either side by a molding which is releasably securable to the bottom of the partitions. In the case of wiring which must pass from one partition to another where the partitions are to be disposed at an angle, a telescoping corner cap is provided. Finally, special connector brackets are provided for connecting partitions of different heights to one another at various angles.

3,831,331
ARTICULATED HOLD-DOWN ANCHOR DEVICE FOR THE EMBEDDED CABLES OF A PRESTRESSED CONCRETE GIRDER

Joseph J. Colado, Addison, Ill., assignor to Superior Concrete Accessories, Inc., Franklin Park, Ill.

Filed Jan. 29, 1973, Ser. No. 327,813
Int. Cl. E04c 5/08, 5/16
U.S. Cl. 52—225 1 Claim

An articulated hold-down anchor device for the embedded cables of a prestressed concrete girder, wherein the frame which supports the usual hold-down rollers for the various tiers of tensioned cables is of a special free floating nature so that it readily bisects the direction-change angle which it creates in the cables as they are undergoing tensioning. In this

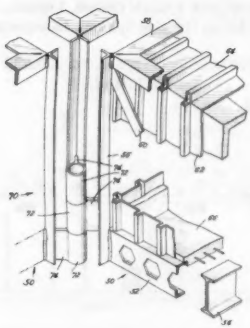


manner, lateral stresses on the frame are equalized so that no bending forces are applied to the anchor bolt which serves to connect the device to the concrete form in which the girder is produced by pouring wet concrete into the form and around the prestressed cables.

3,831,332
MODULAR BUILDING CONSTRUCTION SYSTEM USING SEGMENTED COLUMN ASSEMBLY

Harry M. Weese, 10 W. Hubbard St., Chicago, Ill. 60610

Filed Aug. 18, 1972, Ser. No. 281,706
Int. Cl. E04h 1/04, 9/06
U.S. Cl. 52—236 9 Claims

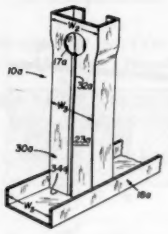


The present invention relates to a system of constructing floors of a building by joining together a plurality of box-shaped modular room units horizontally and vertically. The modular units are interconnected by means of assembling together a plurality of column segment attached to the modular units. A tubular body portion of the column segments are assembled together in a vertical stacked aligned relationship and thereafter the tubular body portions are coupled together by using a tension bar threaded through their axial opening.

3,831,333
CRIMPED END LOAD BEARING MEMBER AND ASSEMBLE THEREOF

Nels Nelsson, Des Plaines; Maurice J. Marchello, Hickory Hills, and Frederick A. Thulin, Jr., Mt. Prospect, all of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Nov. 11, 1971, Ser. No. 197,746
Int. Cl. E04b 2/58
U.S. Cl. 52—241 19 Claims

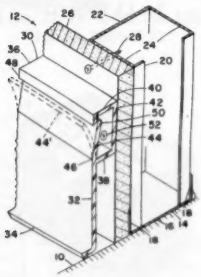


Load bearing members the ends of which are tapered and stiffened by means of a rib in the central web of the member. Build-up of runner tracks into which the members are inserted is eliminated.

3,831,334
PLASTIC WALL TRIM

Edward J. Rutkowski; Jack A. Dawdy, both of Kenmore; Robert F. Hause, Tonawanda, and Irvine G. Reinig, II, Williamsville, all of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Dec. 4, 1970, Ser. No. 95,114
Int. Cl. E04f 19/04
U.S. Cl. 52—287 7 Claims



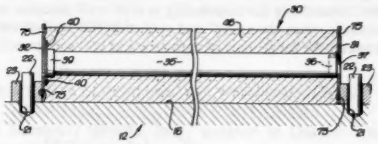
A unitary elongate wall trim member formed of plastic including a closable and lockable cover formed to cover the means, such as screws, used to affix the trim member in place.

3,831,335
PREFABRICATED CAST REINFORCED FRAMED CONCRETE WALL SECTION WITH CLIPS TO ATTACH THE FRAME TO THE REINFORCING

Thomas L. Ary, 1916 Underwood Rd., Holtville, Calif. 92250

Filed Nov. 15, 1972, Ser. No. 306,525
Int. Cl. E04c 2/04, 5/18
U.S. Cl. 52—601 1 Claim

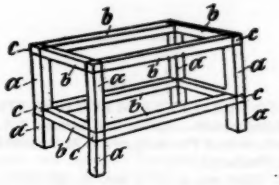
A prefabricated building includes prefabricated wall, ceiling, roof and gable sections, stringer members, partition beams and various arrangements for interconnecting the abovementioned parts to form an assembled structure. An adjustable molding table is provided for use in manufacturing the aforementioned prefabricated sections. In constructing a building, the prefabricated sections are transported to a building site and there mounted and assembled on a foundation. During assembly, various steps are performed to provide a finished structure. Strongbacks are provided for moving the prefabricated sections about at the manufacturing and building sites.



3,831,336
FRAME TO ASSEMBLE AFTER UNITIZED CONSTRUCTION

Bodo Diemer, Schulzenstrasse 22, D-7470 Ebingen, Germany

Filed Mar. 6, 1969, Ser. No. 804,763
The portion of the term of this patent subsequent to Jan. 27, 1989, has been disclaimed.
Int. Cl. E04h 12/00; A47f 5/00
U.S. Cl. 52—648 12 Claims



To lock tubular frame members togethers, such as chair legs, shelf units and the like, a structural element has projecting ends which are profiled to fit within the tubular frame member. The ends are drilled transversely and tapped, and a counter sink is formed at one end of the tapped bore, into which a screw is inserted having a head which preferably has approximately the same diameter as the internal size of the tubular frame member. The drilled end, with the screw completely tightened into the counter sink, is inserted into the frame member which is formed with a small hole to permit access, for example by an Allen head wrench to the screw which is then screwed outwardly, so that the head will bear from the inside against the frame member, and clamp the other side of the insert projection against the opposite inside face of the frame member. To interconnect chair legs, frame members and the like, structural elements having three or more projecting ends may be used.

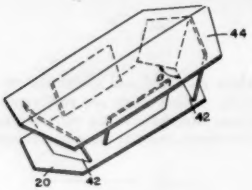
3,831,337
METHOD OF ERECTING FOLDABLE BUILDING STRUCTURES

Delp W. Johnson, 240 Oakview Dr., San Carlos, Calif. 94070

Filed Aug. 2, 1972, Ser. No. 277,445
Int. Cl. E04g 21/14
U.S. Cl. 52—745 5 Claims

A building having a roof constructed of a plurality of initially flat, side by side, hinged together roof sections. Beneath

the roof are two opposing end walls each constructed of a like plurality of wall panels that are hinged together. Each wall panel is further hinged to a corresponding roof section. The hinge lines are arranged so that every set of two roof sections and corresponding two wall panels has hinge lines that originate from a common point. The angle between the hinge axes connecting corresponding sets of roof sections and wall panels is other than 180° and such that the sum of the angles between the hinge axes of a given set of two wall panels equals



the sum of the angles between the hinge axes of a corresponding set of two roof sections. When lifting the roof the panels pivot downwardly with respect to the roof sections into relative angular inclination with each other. Simultaneously there with the roof sections are pivoted out of their common plane into relative angular positions. The relative angularity is a function of the relative positioning of the hinge axes and can be varied as desired to construct buildings having a wide variety of shapes and sizes.

3,831,338

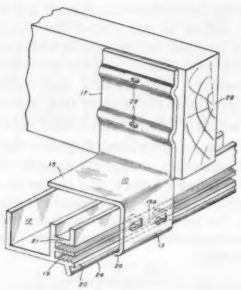
CONNECTING BRACKET FOR BUILDING STRUCTURE

James D. Klingensmith, Apollo, and George J. Latkey, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed July 6, 1972, Ser. No. 269,491

Int. Cl. F16b *7/00*

U.S. Cl. 52—752 **4 Claims**



A building structure combination in which a bracket is attached to an elongated structural member by a fastening means that engages an integral, transversely extending web portion at at least two spaced apart locations therealong, and on opposed sides thereof, with a force sufficient to deform the web and thereby provide an interference fit between the web and the fastening means.

3,831,339

READILY RELEASABLE CLAMPED SPLINE JOINT

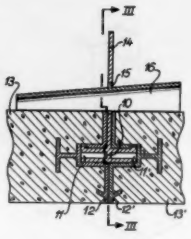
Louis Piralli, 1800-Vevey-Fenil, Switzerland

Filed Dec. 13, 1971, Ser. No. 207,165

Claims priority, application Switzerland, Dec. 17, 1970, 18697/70; Dec. 1, 1971, 17454/71

Int. Cl. F16b *5/06*

U.S. Cl. 52—758 D **6 Claims**



Two plaster panels with peripheral grooved frames are assembled by a tongue member comprising two pairs of resilient flanges extending from opposite sides of an elongate web, one of the flanges of each pair having an outer lateral protuberance resiliently engaging in a correspodning recess in the respective groove. The web may be extended by a lateral wing passing between and protruding from the surfaces of the adjacent panels, and the structure reinforced by a wedge-shaped key member passing through an aperture in the wing and bearing against the adjacent surfaces of the panels.

3,831,340

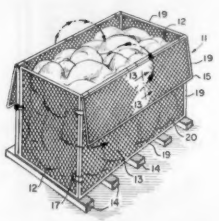
METHOD FOR COMPACTING THERMOPLASTIC FILM MATERIAL AND APPARATUS THEREFOR

Martin J. Tulkoff, 1020 East Lomard St., Baltimore, Md. 21202

Filed Mar. 26, 1973, Ser. No. 344,624

Int. Cl. B65b *1/24*

U.S. Cl. 53—24 **4 Claims**



There is disclosed a method for compacting thermoplastic film material usually waste film material presenting a rather bulky appearance due to incorporation of air pockets. The waste film is oftentimes in the form of thermoplastic bags of fairly heavy gauge and of fairly large size. The bag is usually the result of use as a means to enclose a stack of a plurality of boxes which have been positioned on a pallet. The bag has been removed and discarded. It is accumulated in a receptacle of relatively large size. The receptacle is constructed of open mesh work on all sides and bottom and possesses a size approximating an area dimension of a pallet and a conventional height of a stack of boxes on such a pallet. The receptacle when loaded with a plurality of the bags is subjected to a heat treatment in an oven which surrounds the receptacle along its

sides and top while the receptacle is on the floor, for instance. The oven employed is essentially a housing having an open bottom with a plurality of electric heating elements positioned internally with respect to the inner walls thereof. The oven is relatively movable to encompass the bag containing receptacle. The bags are melted or fused within the receptacle during its dwell time in the confines of the oven. To prevent sticking of the bags to any of the surfaces of the receptacle, at least the inside of the receptacle is given a coating treatment with a plastic release material for instance.

3,831,341

METHOD FOR FILLING CONTAINERS

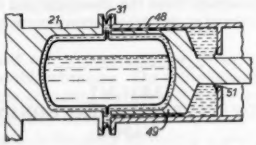
John Harry Gauntlett, Mayfield, 7 Kingsdene, Tadworth, England

Filed Mar. 31, 1972, Ser. No. 240,021

Claims priority, application Great Britain, Apr. 3, 1971, 8613/71

Int. Cl. B65b *3/04, 3/18;* **B67b** *5/00*

U.S. Cl. 53—22 R **15 Claims**



A container for a carbonated beverage is made by bringing two container halves close together and pumping the beverage into the interior through the remaining gap around a major part of the periphery of the container. Then the gap is closed and co-operating flanges welded together.

3,831,342

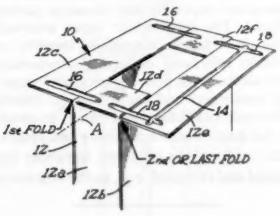
METHOD AND APPARATUS FOR FORMING SIFT PROOF GLUED FLAP SEALS FOR CARTONS

Jack J. Rejsa, Minneapolis, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Jan. 22, 1973, Ser. No. 325,276

Int. Cl. B65b *7/20*

U.S. Cl. 53—47 **6 Claims**



An adhesive applicator is described which includes five adhesive applying nozzles for placing beads of fluid adhesive on a line of moving cartons. Four of the nozzles are moved diagonally with respect to the path along which cartons are moved beneath the adhesive applicator. One nozzle is stationary and is used to produce a straight line of adhesive paralleling the path of motion. The moving nozzles are mounted just above the flaps of the carton which are held in a horizontal position. Each moving nozzle is mounted on a pivot axis positioned above the nozzle opening and oriented at an angle of approximately 30° to the direction of carton motion so that relative movement between the carton and nozzle is at right angles to the main axis of the carton producing a bead across the flaps which is positioned perpendicular to the direction of carton travel. In this manner, an adhesive bead of considerable thickness and of just the desired pattern is applied to the flaps while the cartons move continuously below the glue nozzles. When the flaps are folded inwardly one after the other, the pressure on the adhesive beads causes a squeezing out of adhesive into all the voids of the flap contact area thereby producing a sift proof seal.

3,831,343

DEVICE FOR AUTOMATICALLY FINISHING AND GROUPING PACKAGING CONTAINERS

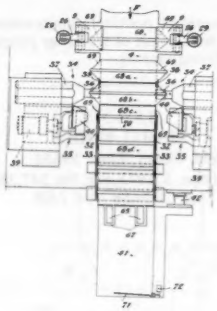
Antonio Dominici, Perugia, Italy, assignor to Quepor S.A., Feibourg, Switzerland

Filed June 19, 1973, Ser. No. 371,535

Claims priority, application Italy, July 10, 1972, 51445/72

Int. Cl. B65b *57/00*

U.S. Cl. 53—61 **10 Claims**



A device for automatically folding and fastening the four ears of prismatic containers, as they issue from a forming machine, upon two opposite lateral faces thereof, and for grouping together the so finished containers, including a stationary table having a container receiving and a container discharging end; a movable plate reciprocable relatively to the table between feed strokes directed from the receiving towards the discharging end and oppositely directed return strokes; preparatory units rigid with the stationary table to prepare the opposite lateral surfaces for the fastening of the ears thereupon; folding and fastening units rigid with the table to fold and fasten the ears upon the faces; rows of pawl means on the movable plate to transfer in succession during the feed stroke the containers on the stationary table stepwise towards the preparatory units, thence to the folding and fastening units and therefrom to the discharge end of said table and to release them at the beginning of each return stroke; and gripping means on said movable plate, located correspondingly to the receiving end of said table, to grip the four ears of each incoming container and transfer it during said feed stokes within reach of the first pawls of said rows and release them before the beginning of said return strokes.

3,831,344

CONTAINER SUPPORT IN A CAPPING MACHINE

David J. Over, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

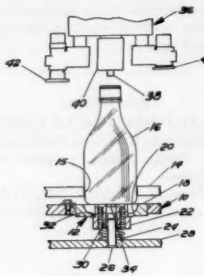
Filed Jan. 26, 1973, Ser. No. 326,767

Int. Cl. B67b *3/08*

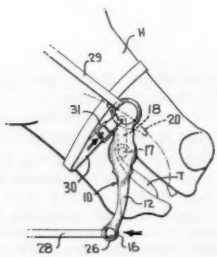
U.S. Cl. 53—329 **1 Claim**

A container support is provided in a capping machine including a platform having an upwardly open recessed seat in it and a spring supported depressible pedestal in the seat, which

in its raised position has its top surface substantially coplanar with the upper surface of the platform so that the container can be moved laterally into and out of position on the platform, and in its depressed position permits seating of the container in the seat for support of the lower peripheral portions of the container during capping.



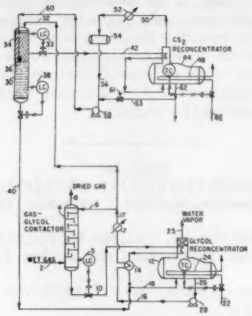
3,831,345
ANIMAL BRIDLE
Maurice Stubblefield, Clancy, Mont. 59634
Filed Apr. 3, 1973, Ser. No. 347,386
Int. Cl. B68b *1/04, 1/06*
U.S. Cl. 54—6 **5 Claims**



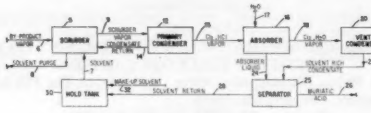
This disclosure relates to an animal bridle which includes a nose and chin strap attached to cheek pieces and adapted to be wrapped at least once entirely about the animal's nose and chin whereby the strap will tighten equally when the bridle is rotated by reining in, the bridle being composed of a pair of spaced cheek pieces joined intermediate opposite ends thereof by a bit, a bar carried by the bit and a mouth roof engaging plate carried by the bar which is preferably pivotally mounted thereupon to provide positive action when in use.

3,831,346
METHOD FOR DEHYDRATION OF WET GASES
Shelby P. Sharp, and Lamar F. Sudduth, both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.
Filed May 9, 1973, Ser. No. 358,785
Int. Cl. B01d *53/4;* **C07c** *29/24*
U.S. Cl. 55—32 **12 Claims**

Absorbent solutions used to dehydrate wet gases tend to accumulate objectionable amounts of heavy hydrocarbons that cannot be removed by usual regeneration methods. Ultimately the absorbent becomes ineffective for water removal. This invention employs a selective solvent such as CS_2 or CCl_4 to remove hydrocarbons from the absorbent and the latter can then be recirculated to the dehydration system as an effective drying agent.



3,831,347
PROCESS FOR SCRUBBING A REACTION BY-PRODUCT VAPOR
Emmett J. Ferretti, Birmingham, Ala., assignor to Diamond Shamrock Corporation, Cleveland, Ohio
Continuation-in-part of Ser. No. 124,300, March 15, 1971, abandoned. This application Feb. 5, 1973, Ser. No. 329,387
Int. Cl. B01d *53/14*
U.S. Cl. 55—48 **11 Claims**

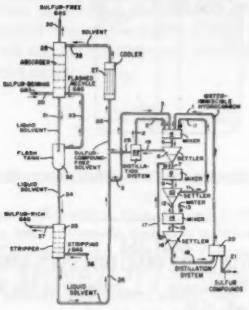


In the reaction of hydrocarbons that may be solid at normal temperature and pressure, or yield products, by-products and/or intermediates that are solid under the same conditions, reaction by-product vapor further contains potential solids-forming material. The by-product vapor evolved from the reaction zone is solvent scrubbed, thereby eliminating plugging problem otherwise occurring downstream. In particular, chlorination reaction by-product vapor may be scrubbed and processed and the hydrogen chloride portion used for its hydrochlorination value. Such by-product can be continuously fed into a water-containing absorption zone from which muriatic acid may be obtained. Scrubber liquid can be in part recovered and recycled, e.g., to the reactor zone.

3,831,348
REMOVAL OF SULFUR COMPOUNDS FROM GLYCOLIC AND ALCOHOLIC COMPOUNDS BY SOLVENT EXTRACTION
Geza Pap, Irvington, N.J., assignor to Allied Chemical Corporation, New York, N.Y.
Filed July 9, 1971, Ser. No. 161,036
Int. Cl. B01d *11/04*
U.S. Cl. 55—73 **10 Claims**

A solvent extraction process for separating sulfur-bearing compounds from solutions thereof in solvents such as glycolic compounds, alcoholic compounds, or mixtures thereof, e.g., dialkyl ethers of polyalkylene glycols. The solvent extraction process involves the use of an extracting solvent consisting of (1) a water-immiscible liquid hydrocarbon compound which

has a boiling temperature in the range of 50° F to 500° F and which is relatively highly miscible with sulfur-bearing compounds and (2) water. Specific water-immiscible hydrocarbons include chlorinated saturated or unsaturated hydrocarbon, aromatic hydrocarbon, chlorinated aromatic hydrocarbon, unsaturated oxygen-containing cyclic hydrocarbon, or



mixtures thereof, e.g., trichloroethylene, benzene, toluene, furan, and monochlorobenzene. The sulfur-bearing solution is subjected to the extracting solvent within any solvent extraction system such that there exists the capabilities of lowering the sulfur content in the sulfur solution to a level substantially below 1 percent by weight of the solution.

3,831,349
GAS CLEANERS

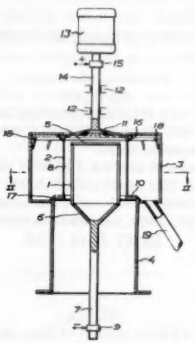
Olle Lennart Siwersson, and Karl Gunnar Tell, both of Helsingborg, Sweden, assignors to AB S.T. Miljoteknik, Helsingborg, Sweden

Filed July 27, 1973, Ser. No. 383,313

Claims priority, application Sweden, Aug. 10, 1972, 10421/72

Int. Cl. B03c *3/10*

U.S. Cl. 55—113 **2 Claims**



An electrostatic filter-type gas cleaner having relatively electrically insulated discharge and collecting electrodes between which the gas to be cleaned is passed. The collecting electrodes are mounted concentrically around the discharge electrodes and are rotatable relative to them so that particles separating from the gas and depositing on the collecting electrodes are almost immediately thrown away from these electrodes. A casing surrounds the collecting electrodes and serves to collect and carry away the particles separated from the gas. The interior space of the casing is not influenced by the gas flow between the discharge and collecting electrodes.

3,831,350
FLUID DISTRIBUTOR

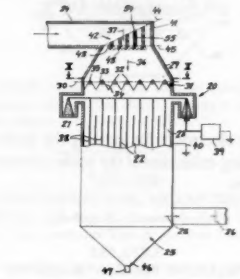
Helmut Gilles, Bergen-Enkheim; Otto Gupner, Offenbach, and Karl Haselmayer, Dorningheim, all of Germany, assignors to Metallagesellschaft Aktiengesellschaft, Frankfurt/Main, Germany

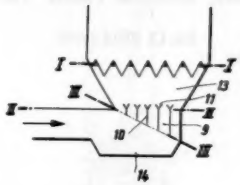
Filed June 19, 1972, Ser. No. 264,279

Claims priority, application Germany, June 22, 1971, 2130826

Int. Cl. B03c *3/36*

U.S. Cl. 55—128 **9 Claims**





A fluid distributor, especially for an electrostatic precipitator or the like, in which the fluid stream passes from a conduit of small cross-section into a region of larger cross-section, as in a diffuser, and the throttle and guide devices include a distributor plane in which V-section throttle elements are provided with a direction of convergence facing toward a source of dust or other particles and substantially independent of the gas-flow direction. The flanks of the V-section distributor are slotted alternately and the closeness or spread of the V-section member can be adjusted to suit distribution requirements. Below the distributor plane is an array of deflector blades of generally Y-shaped cross-section with shanks in stepped relationship along the gas-flow path.

3,831,351
ELECTROSTATIC PRECIPITATOR

Everett Ralph Gibbs, Phoenix, and William Howard Tully, Cockeysville, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

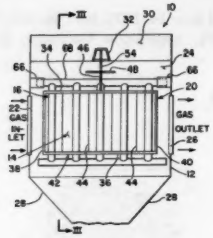
Filed May 22, 1973, Ser. No. 362,834

Int. Cl. B03c *3/08, 3/41, 3/47*

U.S. Cl. 55—147 **15 Claims**

An electrostatic precipitator for collecting acidic elements in an acid-laden gas passing therethrough comprising: a shell; a plurality of substantially flat lead plates which form collector electrodes within the shell and define gas passages between adjacent ones of the collector electrodes for collecting the

acidic elements thereon; and at least one acid-resistant discharge electrode in each of the gas passage between adjacent collector electrodes for ionizing the acidic elements in the gas for causing collection of the acidic elements by the collector electrodes.



3,831,352

DRILLING FLUID DEGASSING

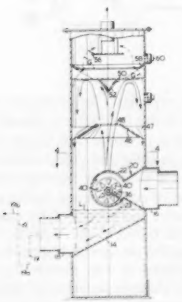
Delbert Arthur Parcels, Calgary, Alberta, Canada, assignor to Keen Industries Ltd., Edmonton, Alberta, Canada

Filed July 14, 1972, Ser. No. 272,062

Claims priority, application Canada, Mar. 20, 1972, 137,507

Int. Cl. B01d *19/00*

U.S. Cl. 55—193 10 Claims



A drilling mud degasifier includes a chamber within which a sub-atmospheric pressure is maintained. Gasified mud enters the chamber and encounters a rotating impeller which agitates the mud and flings it into the chamber interior where such mud strikes a plurality of baffles thus exposing a large surface area of mud to the low pressures within said chamber and effecting degasification of same.

3,831,353

FUEL VAPOR CONTROL DEVICE

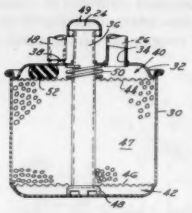
Robert L. Toth, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 4, 1972, Ser. No. 295,047

Int. Cl. B01d *53/00*

U.S. Cl. 55—387 6 Claims

A canister containing a fuel vapor adsorbent has a fuel vapor inlet, a fresh air inlet and a purge vapor outlet. It additionally contains a baffle between the vapor inlet and purge outlet to prevent direct communication of fuel vapors to the purge outlet while forcing the flow of fuel vapors through the adsorbent.



3,831,354

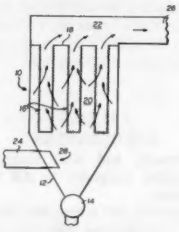
DUST COLLECTOR INCLUDING DIFFUSER ASSEMBLY

Even Bakke, New Providence, N.J., assignor to The Slick Corporation, New York, N.Y.

Filed Feb. 14, 1972, Ser. No. 225,909

Int. Cl. B01d *46/02*

U.S. Cl. 55—418 7 Claims



A diffuser assembly for dust collectors and like apparatus for converting a high velocity stream of particulate bearing gaseous carrier of relatively small cross-sectional area by aerodynamic diffusion into a low velocity stream of much larger cross-sectional area having said particulates uniformly distributed therein.

3,831,355

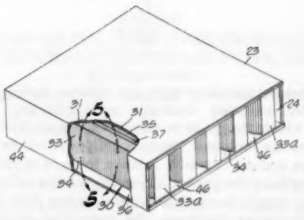
AIR FILTER ASSEMBLY

Charles C. Mugford, Hermosa Beach, Calif., assignor to Farr Company, El Segundo, Calif.

Continuation-in-part of Ser. No. 120,079, March 2, 1971, Pat. No. 3,802,169. This application Feb. 18, 1972, Ser. No. 227,442The portion of the term of this patent subsequent to Sept., 1991, has been disclaimed.

Int. Cl. B01d *27/06*

U.S. Cl. 55—484 12 Claims



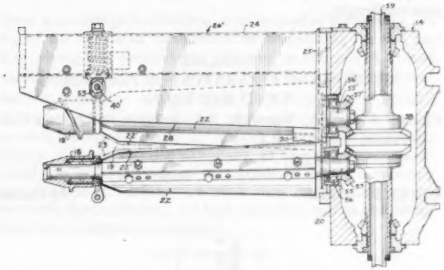
A compact filter assembly for providing a large filter area in a relatively small and inaccessible space, the assembly in-

cludes a housing having an air inlet and air outlet means with a plurality of filter elements in the housing separating the air ilet and air outlet means. Each filter element includes a pair pleated filter media panels which converge at each end to form a rigid hollow column member. The column member is sealably secured at each end to the housing, with the interior of each hollow column member encircling the air outlet means. Thus, air entering the air inlet of the housing flows radially inward through the panels of filter media into the interior of the column members and axially therefrom through the air outlet means.

3,831,356
DRIVE MECHANISM FOR CORN HEADER GATHERING UNIT

Arved Maiste, Brantford, Ontario, and Walter F. Seton, Galt, Ontario, both of Canada, assignors to White Motor Corporation of Canada Limited, Brantford, Ontario, Canada

Filed Mar. 21, 1973, Ser. No. 343,432
Claims priority, application Canada, Mar. 20, 1972, 137511
Int. Cl. A01d *45/02*
U.S. Cl. 56—10.3 **12 Claims**



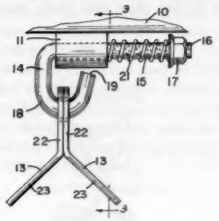
A drive mechanism for corn header gathering unit which is housed in a gear box designed so as to serve as an integral mounting member between the gathering unit and the main frame of a combine on which the unit is adapted to be mounted. The mechanism incorporates a single power input-output shaft assembly for a multi-row gathering unit which includes bevel gear drives for stalk rolls and gathering chains and a safety clutch, with all the gear components submerged in a lubricant and the safety clutch in a separate lubricant containing compartment and with a readily removable cover plate on the gear box which provides easy access for servicing.

3,831,357
RELEASABLE BLADE HOLDER FOR FLAIL MOWER

Bernard C. Mathews, P.O. Box 70, Crystal Lake, Ill. 60014

Continuation-in-part of Ser. No. 383,996, July 30, 1973. This application Sept. 14, 1973, Ser. No. 397,412
Int. Cl. A01d *55/22*
U.S. Cl. 56—294 **6 Claims**

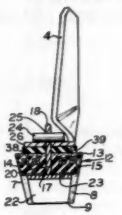
The rotor drum has sleeve type mounts secured to its surface. A blade hanger connects the blades to each sleeve type mount. The blade hanger has a long straight shank received within the sleeve and a partially closed link portion terminating in a free end. The link shank slides within the sleeve between a normal position and a release position. In the normal position, the free end is closely spaced from the outer surface of the sleeve to prevent removal of a blade from the link portion. In the release position, the free end is laterally offset from the sleeve to permit blade removal. A coil spring surrounding the shank biases the link into its normal position. A nut at the remote-end of the shank prevents removal of the shank from the sleeve.



3,831,358
BELT AND CONNECTING MEANS THEREFOR

Richard L. Marsh, and Roy E. Semin, both of Lincoln, Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 4, 1972, Ser. No. 250,262
Int. Cl. A01d *55/24*
U.S. Cl. 56—291 **22 Claims**



An improved combination of a belt and connecting means for the belt for securing accessory attachments thereto. The belt includes a body of flexible resilient material having one or more grooves of arcuate configuration extending into and across one surface of the belt. The connecting means includes a connector member extending through and projecting beyond the portion of the belt adjacent the arcuate surface of the groove and a bearing member attached to one end of the connector member. The bearing member engages the groove and has an arcuate portion substantially conforming to at least a portion of the arcuate surface of the groove to provide for a substantially uniform distribution of stresses over the arcuate surface of the groove as the belt flexes during use. Accessory elements such as cutting blades, rake fingers, pick-up hooks and the like may be attached to the connector member to be carried by the belt as it travels around spaced pulleys.

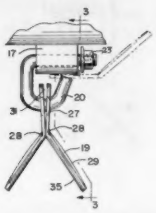
3,831,359
BLADE ASSEMBLY FOR FLAIL MOWER

Bernard C. Mathews, Box 70, Crystal Lake, Crystal Lake, Ill. 60014

Filed July 30, 1973, Ser. No. 383,996
Int. Cl. A01d *55/22*
U.S. Cl. 56—294 **3 Claims**

A blade assembly for a loop type blade mount of a flail rotor comprises two side slicer blades and a common supporting link. The link has a straight shank portion which is received in the loop type blade mount and removably secured therein by a

clinch nut. It also has a curved portion which provides a partially closed loop on which the blades are mounted. The clearance between the free end of the curved portion and the mount surface is less than the blade thickness to prevent



removal of either blade unless the link is first withdrawn from the blade mount. The side slicer blades are widest at the bend to provide a protruding edge which prevents grass stems from wedging in the crevice between the blade shanks.

3,831,360

TEXTURIZED STAPLE FIBER STRUCTURES

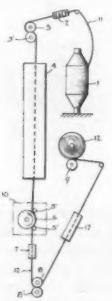
Lajos Horvath, Wallisellen, Switzerland, assignor to Heberlein & Co. AG, St. Gall, Switzerland

Filed Nov. 2, 1972, Ser. No. 303,002

Claims priority, application Switzerland, Nov. 5, 1971, 16105/71; Mar. 9, 1972, 3472/72

Int. Cl. D02g *1/02, 3/00, 3/34*

U.S. Cl. 57—2 **21 Claims**



Method and means for forming continuously by high-twisting a bundle of endless filaments, and grinding or cutting same while in the high-twisted state. The high-twisted bundle may be heat set before or after the grinding or cutting action, or not at all.

3,831,361

MACHINE FOR THE MANUFACTURE OF CORDS AND ROPES

Martin Ullmann, CH-9030 Abtwil, Switzerland

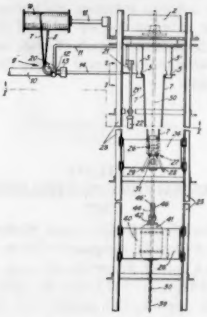
Filed Apr. 11, 1973, Ser. No. 350,248

Claims priority, application Switzerland, Apr. 11, 1972, 5329/72

Int. Cl. D07b *3/00*

U.S. Cl. 57—25 **8 Claims**

A machine for the manufacture of cords and ropes, comprises motor-driven roving cylinders, strand clamps for said cylinders, a strand conveyor with strand feeders for feeding said cylinders, a travelling guide trolley having means for feeding strands drawn out from said roving cylinders in lengthwise loops and combining them with a rotating laying device of a laying trolley which is continuously under the effect of a tension device said tension device being adapted to be drawn forward during the laying process by the entry of the strands or



cords up to adjustable stops which determine the hardness of the strand or cord, whereby the cord can be manufactured entirely automatically with simultaneous determination of hardness and length.

3,831,362

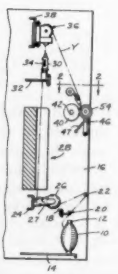
METHOD AND APPARATUS FOR PRODUCING TEXTURED YARN

Chester J. Dudzik, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed July 31, 1967, Ser. No. 657,288

Int. Cl. D02g *1/02;* **B65h** *54/42*

U.S. Cl. 57—34 HS **18 Claims**



Method and apparatus for producing yarn, especially textured thermoplastic yarn, including winding the yarn up into a soft package suitable for reprocessing, as by autoclaving, to yield set yarn.

3,831,363

APPARATUS AND PROCESS FOR AIR TEXTURIZING OF YARNS

Herbert J. Pike, Martinsville, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.

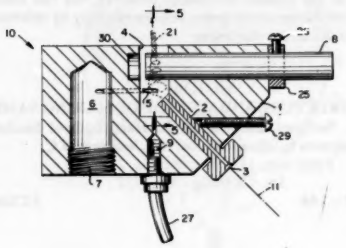
Continuation-in-part of Ser. No. 213,274, Dec. 29, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 314,070

Int. Cl. D02g *1/16*

U.S. Cl. 57—34 B **7 Claims**

A jet texturizing or twisting apparatus having a texturized chamber with an adjustable direction changing rod extending across the chamber at right angles to yarn travel and having an

axis offset with respect to the axis of the chamber, means for introducing yarn to be texturized, plied or both at an acute angle into a zone in which compressed air is introduced tangentially, causing a vortex which spins a loop or crank-shaped portion of the yarn, imparting to it a false twist. There can be either one yarn inlet at an angle or there may be two inlets. After the false twist, if it is desired to texturize, the direction of the yarn is changed by the adjustable rod and the yarn partially untwists as it moves across the rod, thus changing its direction. If there are two yarn inlets and hence two yarns introduced and the rod can be withdrawn to the point where



there is no change in direction, then instead of texturizing, plying of the two yarns takes place. By introducing the rod part way, plying and partial texturizing can be effected. A process modification is also described in which the yarn before entering the apparatus is moistened. Heat may be also applied, either to the wet yarn before it enters the exit of the texturizer or after leaving the texturizer or both. This results in a partial setting of the loops where the rod has been introduced sufficiently to effect change of direction and hence texturizing. The process is usable even with very fine denier yarn of synthetic thermoplastic, and high operating speeds and, therefore, large outputs are obtained.

3,831,364

SPINNING MACHINES HAVING SPINDLE RAILS MOVABLE FOR TUBE EXCHANGING

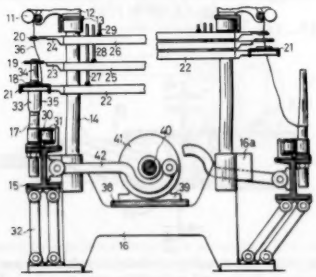
Hajime Kawakami, Tokyo, and Fumihiko Yamamoto, Ichikawa, both of Japan, assignors to The Nippon Keori Co., Ltd., Kyogo-ken, Japan

Filed Oct. 11, 1973, Ser. No. 405,287

Claims priority, application Japan, Nov. 6, 1972, 47-110984

Int. Cl. D01h *9/04, 9/14*

U.S. Cl. 57—54 **19 Claims**



Improvements in ring spinning machines of the type having spindle rails selectively translatable between an initial position, for the spinning operation, and a second position spaced outwardly from the initial position, in order to provide a very substantial clearance over the spindles for tube doffing and donning operations. The spindle rails can be tightly held against the fixed part of the machine during spinning with the identical linkage device serving for translation of the spindle rails between the initial and outward positions, without any other locking means. A tangential belt spindle drive system is arranged [illegible]anner that there is a transmission path from the motor [illegible]unted on the fixed end portion of the machine to the spindles carried on the translatable spindle rails irrespective of the position of the spindle rail and that the spindles are always engaged by the tangential belt, with the result that the spindles will be prevented from rotating during tube exchanging, provided the motor is stopped.

3,831,365

METHOD AND APPARATUS FOR APPLYING A FALSE TWIST TO YARNS

Joseph F. Smith, 1407 Hobbs Rd., Greensboro, N.C. 27410

Filed Oct. 26, 1973, Ser. No. 410,230

Int. Cl. D01h *7/92;* **D02g** *1/04*

U.S. Cl. 57—77.4 **13 Claims**

A false twist is applied to a continuously advancing yarn by tangential contact of a first run of the yarn with a series of yarn flights that intersect and rotate the first run of yarn by frictional contact therewith. The yarn passes around a plurality of freely rotatable rollers and forms a series of yarn flights which intersect and frictionally contact the first run of yarn to apply a false twist thereto.

3,831,366

DEVICE FOR FALSE-TWIST TEXTURING OF TEXTILE YARNS

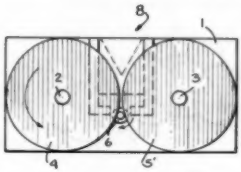
Josef Raschle, Butschwil, Switzerland, assignor to Heberlein & Co. AG, Wattwill, Switzerland

Filed Nov. 1, 1973, Ser. No. 411,799

Claims priority, application Switzerland, Nov. 16, 1972, 16717/72

Int. Cl. D02g *1/04;* **D01h** *7/92*

U.S. Cl. 57—77.45 **16 Claims**



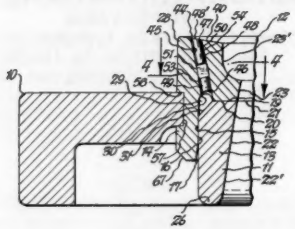
A device for false-twist texturing of textile yarns has two axially parallel rotatable rollers for supporting at least one twist tube in a cuneal throat between the rollers and in tangential contact with the roller rims, and a magnet for pressing the

same against the rollers, the magnet consisting of at least one axially polarized magnet element and pole pieces connected with same and the same arranged and shaped so that it does not extend beyond the contours of the rollers.

3,831,367
SPINNING AND TWISTING RING CONSTRUCTION

Hyatt B. Atwood, Buffalo, and James N. McLean, Tonawanda, both of N.Y., assignors to Herr Manufacturing Company, Inc., Tonawanda, N.Y.

Filed Apr. 10, 1972, Ser. No. 242,691
Int. Cl. D01h *7/62*
U.S. Cl. 57—120 **9 Claims**

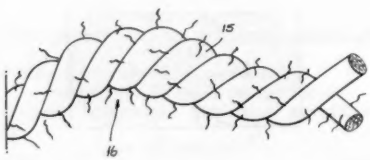


A spinning and twisting ring comprising an upper annular portion and a lower annular portion pressed into engagement therewith with an interference fit, first and second contiguous surfaces on said upper and lower annular portions for defining a seam, a bearing surface formed by said first and second annular portions, a lubricant groove formed by adjacent portions of said upper and lower annular portions, and slot means formed in said seam, said slot means having one end in communication with said lubricant groove and the opposite end terminating at said bearing surface for conducting lubricant to said bearing surface, a second bearing surface on said upper annular ring portion, and a plurality of spot lubrication conduits extending between said lubricant groove and said second surface, said spot lubrication conduits each including a bore in said upper annular ring portion, a pin mounted within said bore and retained therein with an interference fit, and a clearance between said pin and said bore for defining a lubricant channel between said lubricant groove and said second bearing surface.

3,831,368
SELF-CRIMPED YARN AND METHOD OF PRODUCING THE SAME

Anthony S. Glowacki, Columbia, S.C., assignor to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 215,014, Jan. 3, 1971, abandoned. This application May 11, 1973, Ser. No. 359,523
Int. Cl. D02g *1/18, 3/04*
U.S. Cl. 57—140 BY **14 Claims**



A high bulk, self-crimped plied yarn for use in carpets is disclosed. The composite yarn includes at least two or more component yarn ends, of which at least one must be a prebulked filament yarn of a heat-shrinkable synthetic fiber, while the remaining ones are spun staple fiber yarns. The starting yarn ends are individually twisted in the same sense, although the magnitudes of the twists may be different, and are plied with a twist in the opposite sense. Upon exposure of the plied yarn to heat, the filament yarn component shrinks, but such shrinkage is restricted by the spun staple fiber yarn component. This results in the formation of a relatively large crimp or "kink" in the composite yarn which is then heat-set therein and imparts thereto bulk properties simulative of Murchie or stuffer box crimped yarns. The component yarns may have different dye affinities to permit production of multi-colored yarn. This abstract is not to be taken either as a complete exposition or as a limitation of the present invention, however, the full nature and extent of the invention being discernible only by reference to and from the entire disclosure.

3,831,369
YARN STRUCTURE AND METHOD OF MAKING SAME

Francis B. Northup, and Donald R. Hart, both of Sanford, N.C., assignors to Spanco Yarns, Inc., Sanford, N.C.

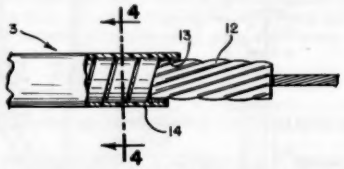
Filed Aug. 11, 1972, Ser. No. 279,944
Int. Cl. D02g *3/04, 3/32*
U.S. Cl. 57—144 **5 Claims**

A yarn and method of making same formed from a roving having a plurality of substantially parallel untwisted discontinuous textile fibers and a single continuous yarn strand wrapped about said roving forming spaced-apart helices having uniform directions.

3,831,370
SAFETY BELT SYSTEM

William J. Gilmore, Manitou Beach, Mich., assignor to American Chain & Cable Company, Inc., New York, N.Y.

Division of Ser. No. 203,685, Dec. 1, 1971, Pat. No. 3,785,701. This application May 31, 1973, Ser. No. 365,540
Int. Cl. D07b *1/08*
U.S. Cl. 57—145 **6 Claims**

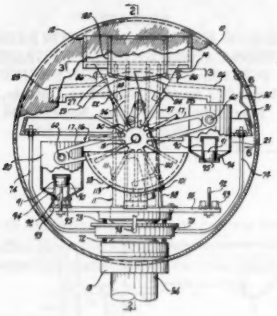


A safety belt system using a bendable cable section having a self-sustaining shape and a flexible strap section. The cable section is fixed on one side of the seat for positioning at the side of the occupant of the seat. The flexible strap section is fixed at the other side of the seat for extending across the seat and the occupant. Fastening means connected to the free ends of the cable and belt are provided for attaching the end of the belt to the cable at the one side of the occupant.

3,831,371
FLUID CLOCK MECHANISM

Oskar F. Vatterott, St. Louis, Mo., assignor to Jackson J. Shinkle, St. Louis, Mo.

Filed Aug. 21, 1973, Ser. No. 390,313
Int. Cl. G04b 45/00
U.S. Cl. 58—2 11 Claims

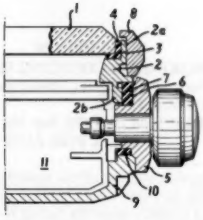


This fluid clock includes an oscillating pallet arm assembly rotatively mounted to a base and carrying buckets at each end. A reservoir is mounted to the base and fluid is supplied to the buckets alternately through a valve controlled conduit system. The valve is provided with an apertured sliding member of arcuate configuration, which oscillates with the pallet arm assembly and selectively opens and closes the conduit system. The buckets are charged in an ascended position and automatically discharged in a descended position. The pallet assembly is mounted to a ratchet controlled shaft, which forms part of a drive mechanism rotating a circular time indicator. A timing mechanism is provided by a shaft-mounted rotor adjustably immersed within a second reservoir.

3,831,372
WATERTIGHT WATCHCASE

Shoji Isono, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Dec. 5, 1973, Ser. No. 421,853
Claims priority, application Japan, Dec. 8, 1972, 47-140386
Int. Cl. G04b 37/08
U.S. Cl. 58—90 R 6 Claims

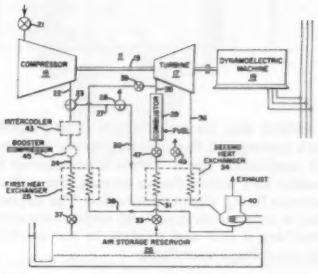


A watertight watchcase having a watertight first elastic ring seal without adhesive between a watch crystal and a watch crystal ring circumferentially of the ring seal and watch crystal. The watch crystal ring is provided with two flange surfaces remote from the first ring seal and lying in two planes normal to each other. A second elastic ring seal is received against these two surfaces and compressed thereagainst by a circumferential shoulder on a watchcase band effecting a second watertight seal without adhesive between the watch crystal ring and the watchcase band. A bezel is applied against the watch crystal ring circumferentially thereof compensating for the restoration forces of the elastic ring seals.

3,831,373
PUMPED AIR STORAGE PEAKING POWER SYSTEM USING A SINGLE SHAFT GAS TURBINE-GENERATOR UNIT

Frank V. Flynt, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 8, 1973, Ser. No. 330,604
Int. Cl. F02c 3/12
U.S. Cl. 60—39.33 5 Claims

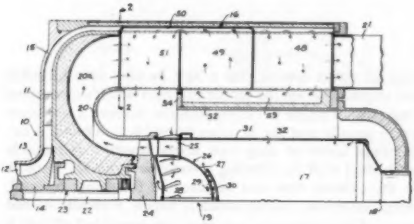


A pumped air storage peaking power system is disclosed which comprises a standard single shaft gas turbine-generator unit used in conjunction with a system of valves. The system may be operated in pumping mode for air storage, in peaking mode as an extra-power gas turbine operating with stored compressed air, or as a conventional gas turbine operating with ambient air, all through appropriate valve settings.

3,831,374
GAS TURBINE ENGINE AND COUNTERFLOW HEAT EXCHANGER WITH OUTER AIR PASSAGEWAY

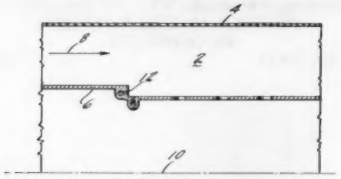
John Nicita, El Cajon, Calif., assignor to Power Technology Corporation, Bloomfield Hills, Mich.

Continuation of Ser. No. 175,819, Aug. 30, 1971, abandoned.
This application June 28, 1973, Ser. No. 374,800
Int. Cl. F02c 7/10; F28f 3/00
U.S. Cl. 60—39.51 R 8 Claims



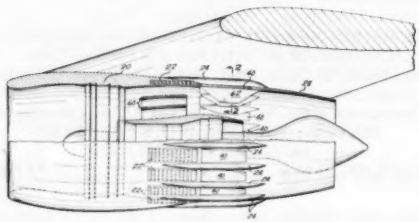
A gas turbine engine comprising a compressor, a turbine, and a burner. The turbine is interposed between the compressor and the burner. The exhaust gases of combustion from the turbine are reversed and moved axially while the air from the compressor is moved in a sinuous path in heat exchange relationship to the movement of the exhaust gases axially.

3,831,375
PILOTING FLAMEHOLDER FOR JET ENGINE
Clyde C. Richard, Vernon, and Alexander Vranos, Rockville, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Apr. 7, 1967, Ser. No. 632,143
Int. Cl. F02g 1/00
U.S. Cl. 60—39.72 3 Claims



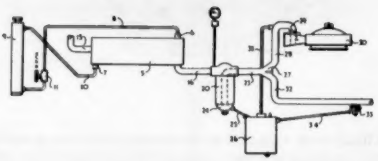
An annular duct for use primarily in jet propulsion devices in which igniting and flameholding means are incorporated to form a combustion space. This is accomplished by providing an annular wall within the air stream, the wall containing a downstream facing stepped formation. The stepped formation provides a combustion space and additionally contains means for supplying a fuel and oxidant to the combustion space thereby providing a pilot flame.

3,831,376
THRUST REVERSER
James R. Moorehead, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Napoli, Italy
Filed Feb. 5, 1973, Ser. No. 329,770
Int. Cl. F02k 3/06
U.S. Cl. 60—226 A 8 Claims



A fan air thrust reverser for a high by-pass ratio turbofan aircraft engine wherein the fan air exit duct wall is constructed as a thin wall or single thickness panel to achieve a low boattail angle nacelle and the reverser assembly comprises a circumferential series of plug type doors inwardly retractable from the duct wall for forming transverse openings through which the exhaust flow can be directed for thrust reversal, provided that thrust reverser cascade panels, normally stowed upstream of the transverse openings, are translated aft into a position over the transverse openings; and the plug type doors are further actuated to rotate inwardly for flow blockage from their trail or idling position parallel to the fan airstream. Safety features being in first translating the blocker door through a parallelogram linkage arrangement to a fan flow trail position, which, if accidentally happened at high speed, would not reverse thrust without further application of signal and power. Also, at high speed (or any speed where reversing was not desired in flight), the cascades must be positioned over the openings or only lateral thrust would result all around the nacelle. The reverser system is thus armed by first placing the cascades over the door openings during take off and just prior to touchdown-landing.

3,831,377
METHOD OF AND APPARATUS FOR REDUCING POLLUTION CAUSED BY EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE
Albert Z. Morin, 973 Ann St., North Bay, Ontario, Canada
Filed July 24, 1972, Ser. No. 274,804
Int. Cl. F02m 25/06; F01n 3/02
U.S. Cl. 60—274 3 Claims

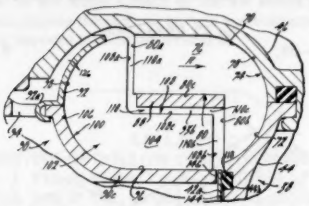


A method and apparatus for treating the exhaust emissions of an internal combustion engine to reduce the pollution of the atmosphere caused thereby that employs a closed circuit cooling system to substantially reduce the temperature of the exhaust contracting its volume, condensing gaseous vapours to liquid form; drains off the liquid, filters the dewatered gases to remove solids; stratifies the filtered gas and conveys the lighter more volatile gases to the engine fuel intake, discharging the residual fraction of cooled, contracted, dewatered and filtered heavier gases to the atmosphere. Additionally, any volatile fumes rising off the liquids collected from the exhaust flow may also be fed to the engine fuel intake. The closed circuit cooling system includes a radiator separate from the engine's usual radiator and an engine operated pump for driving the coolant in the system.

3,831,378
HYDROKINETIC COUPLING SLEEVE SEAL
Warren G. Bopp, Farmington, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed June 25, 1973, Ser. No. 373,201
Int. Cl. F16h 41/04
U.S. Cl. 60—353 9 Claims

A hydrokinetic coupling of the toroidal fluid flow type having an impeller member and a turbine member. The impeller member has a radially inwardly facing trough positioned radially outward of the turbine member which has a radially outwardly facing trough. The troughs together form a toroid of substantially elliptical cross section. A plurality of mutually facing stepped blades circumferentially disposed in the impeller and turbine member troughs define a stepped annular gap between the members. The gap is generally Z-shaped and includes two gap portions parallel to the rotational axis of the members radially offset by a third gap portion transverse to the rotational axis. An annular core guide ring is disposed in the transverse gap portion and secured to the impeller blades; this ring cooperates with a cylindrical sleeve, which is selec-

tively movable into one of the offset gaps, to control fluid circulation between the impeller and the turbine. An annular split seal, carried by a portion of the impeller member,



cooperates with the cylindrical sleeve to prevent fluid leakage from the impeller when the cylindrical sleeve is fully inserted into the offset gap and seated against the core guide ring.

3,831,379

CONTROL APPARATUS FOR A HYDRAULIC MACHINE

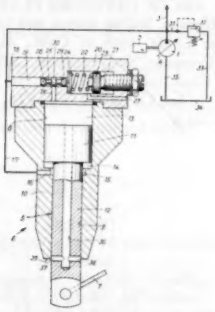
Manfred Lixenfeld, Ludwigsburg, and Karl Reiff, Sersheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed June 7, 1971, Ser. No. 150,695

Claims priority, application Germany, June 13, 1970, 2029239

Int. Cl. F15b *15/22, 15/17;* **F16h** *39/46*

U.S. Cl. 60—446 **7 Claims**



The normal regulation of a pump is effected under the control of a differential piston forming in a cylinder, an annular chamber directly communicating with a pressure conduit of the pump, and a cylinder chamber connected by a pressure-responsive valve with the pressure conduit. The piston has a conduit connecting the cylindrical chamber with a port cooperating with a control edge of the cylinder. At very high pressure in the pressure conduit of the pump, the piston moves to a position in which the port is uncovered by the control edge, and the pressure fluid from the cylinder chamber is discharged through the port so that the piston is resiliently stopped by the pressure fluid in the annular chamber, and then moved back.

3,831,380

HOT-GAS ENGINE

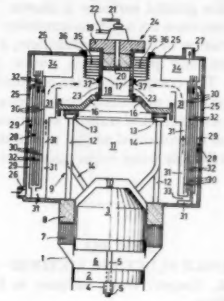
Anton Marie Nederlof, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,542

Claims priority, application Netherlands, Jan. 13, 1972, 7200483

Int. Cl. F23k *5/00*

U.S. Cl. 60—524 **2 Claims**



A hot-gas engine having a heater which is composed of pipes and which supports an assembly of a burner device, and a fuel atomizing device which is displaceable axially with respect to the enveloping housing corresponding to thermal expansion of the heater pipes.

3,831,381

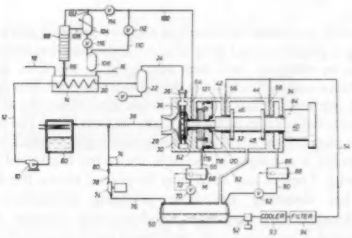
LUBRICATING AND SEALING SYSTEM FOR A ROTARY POWER PLANT

Judson S. Swearingen, 2235 Carmelina Ave., Los Angeles, Calif. 90064

Filed May 2, 1973, Ser. No. 356,580

Int. Cl. F01m *9/00*

U.S. Cl. 60—657 **19 Claims**



In a power system including a shaft driven by expanding a working fluid in a turboexpander and a housing surrounding the shaft and the rotor of the turboexpander, a seal is provided between a process zone containing the rotor and a lubricant zone by injecting a seal fluid into the housing between the two zones at a relatively high pressure. The seal fluid is preferably comprised of the lightest constituent of the working fluid, and the system includes means for recovering the seal fluid from the lubricant and from the working fluid and recycling it.

3,831,382
METHOD FOR REDUCING WATER LOSS THROUGH SOIL BY SEEPAGE

Frank L. Califano, Hackensack; George Stepien, Jr., Montclair, and Thomas E. Russell, Whippany, all of N.J., assignors to The Flintkote Company, White Plains, N.Y.

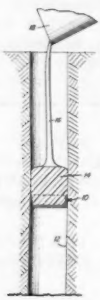
Filed Oct. 10, 1972, Ser. No. 296,114
Int. Cl. E02b *5/02, 3/04*
U.S. Cl. 61—1 R **6 Claims**

A composition for reducing the loss of liquids by seepage through permeable ground surfaces is shown. The composition desirably comprises an aqueous emulsion of asphalt including a combination of cationic emulsifiers, a nonionic surface active agent and preferably a minor proportion of elastomer solids. The compositions are adapted for spray application on natural and man-made beds of rivers, ponds and other water impoundment and transfer structures. The stability of the emulsion is controlled so that penetration of the soil is achieved and a flexible water impervious mass is obtained.

3,831,383
HOLE PLUGGING METHOD

Gerald E. Crank, Casper, Wyo., assignor to Hole Pluggers, Inc., Casper, Wyo.

Filed July 18, 1972, Ser. No. 272,891
Int. Cl. E02d *3/08*
U.S. Cl. 61—35 **9 Claims**

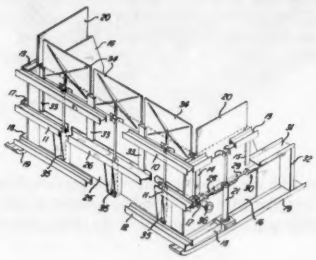


Holes in the earth surface and the like are plugged by first placing a prefabricated plug at a predetermined position in a hole to be plugged, and then arranging in the hole another plug above and limited by the prefabricated plug. The another plug is preferably formed in the hole by expanding a water-tight material such as a polyurethane so as to block the hole. A further plug constructed from a non-settling material such as a vermiculite is arranged in the hole above the expanded water-tight plug. Topsoil and seed may be placed above the further plug for finishing the hole plugging procedure. The prefabricated plug may have a substantially circular, planar base member provided with peripheral portions and diverging walls extending from the peripheral portions in a common direction from the base member. The diverging walls may have a plurality of corrugations arranged extending in a direction of divergence of the walls for permitting the adjustment of the walls to various size holes. The further plug may be preformed and combined with the topsoil and seed element to form a pre-packaged unit. The steps of placing the prefabricated plug and forming the expanded, water-tight plug may be used to fill voids adjacent to and communicating with the hole. After the expanded plug has been formed, the hole may be re-drilled without removing the expanded material from the voids.

3,831,384
SHUTTERING FOR USE IN A MINE AND METHODS OF USE THEREOF

Edward Kempster, Llanelly, Wales, assignor to Thyssen (Great Britain) Limited, Llanelly, Carmarthenshire, Wales

Filed Sept. 18, 1972, Ser. No. 289,636
Claims priority, application Great Britain, Sept. 21, 1971, 44028/71
Int. Cl. E02d *15/00*
U.S. Cl. 61—35 **9 Claims**

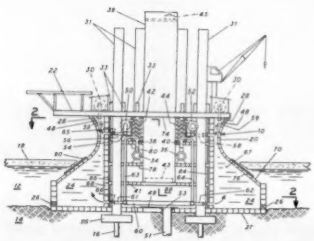


For forming gateside packs, roof supports, stoppings, etc. in a mine from pit dirt with a quick setting cement, shuttering is employed having a main frame with side walls, each side wall having hydraulically operable extension plates to adjust the wall height. The front plate of the shuttering, with its adjustable extension plates, is movable between the side plates in a direction normal to the front plate, hydraulic rams being provided for this purpose. After material has been injected into the shuttering, the side plates are moved forwardly leaving the front plate to support the pack. The front plate can then be moved forward to give a further space for injecting material.

3,831,385
ARCTIC OFFSHORE PLATFORM

Thomas A. Hudson, Balboa Island, and Gordon E. Strickland, Jr., Yorba Linda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed June 26, 1972, Ser. No. 266,084
Int. Cl. E02b *15/02*; **F24j** *1/00*
U.S. Cl. 61—46.5 **15 Claims**



A method and apparatus for reducing ice forces on a marine structure erected in a body of water which becomes frozen through natural weather conditions. The structure has a wall of heat transmitting material forming its perimetrical surface in the zone where natural ice will freeze onto or impinge against the structure. Enclosed chambers are built within the structure and in heat transmitting relationship with the outer wall and heat is applied to the chambers to heat and maintain the outer wall at a temperature above the melting point of the natural ice occurring in the water around it. In a preferred em-

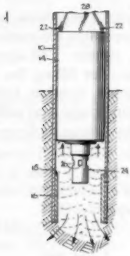
bodiment the marine structure is formed with a heated wall which slopes upwardly and inwardly in the area of ice contact to provide a ramp-like surface upon which a sheet of ice will be forced with reduced friction as it moves against the structure. Thus an edge of the sheet of ice will be prevented from adhering to the structure and will be lifted above its normal position on the water surface as the ice moves against the structure, causing the sheet to be bent and fractured, reducing the force imposed by it on the structure.

3,831,386

DRIVING OF HOLLOW TUBULAR MEMBERS

Lindsey J. Phares, Sugar Land, and George J. Gendron, Houston, both of Tex., assignors to Raymond International Inc., Houston, Tex.

Filed Feb. 26, 1973, Ser. No. 335,703
Int. Cl. E02d 7/10
U.S. Cl. 61—53.54 **10 Claims**



A hollow tubular member such as an open ended pile shell is driven by a sequence of explosions near its lower end. These explosions evacuate the lower end and loosen the earth beneath the member. The explosions also lift a massive element within the tubular member and this element falls back and drives the member into the loosened earth.

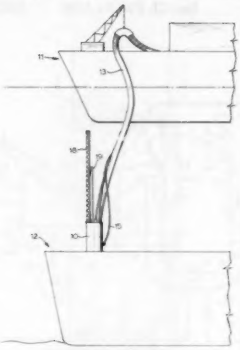
3,831,387

APPARATUS FOR SALVAGING OIL FROM SUNKEN VESSELS

Jack Rolleman, Edmonton, Alberta, Canada, assignor to Salvage Oil Systems, Ltd., Edmonton, Canada

Filed Mar. 16, 1973, Ser. No. 342,090
Claims priority, application Great Britain, Mar. 24, 1972, 14091/72
Int. Cl. B63c 11/00
U.S. Cl. 61—69 A **16 Claims**

According to the invention, removal of oil from a sunken vessel is obtained by means of a remotely controlled submersible "pump-house" or salvage capsule which performs, without the services of divers, all the necessary functions to gain access to, and remove to the surface, oil contained in the sunken vessel. Instead of relying on manual operations performed by divers on the sunken vessel, the essential features of the present invention include remotely controlled means on and within the salvage capsule for effecting the necessary functions including: means for securely but detachably fixing the capsule in the decking or hull of the vessel in proximity to the compartment from which the oil is to be salvaged; drill means for providing access to the compartment through one or more openings, extensible oil suction pipe means for insertion into the compartment through the opening, first pump means for removing oil from the ship compartment into a holding



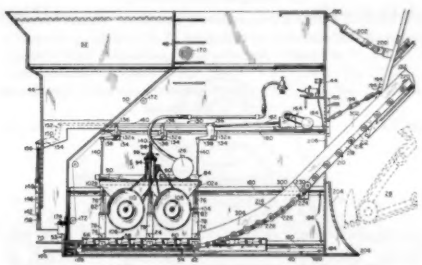
chamber within the capsule and second pump means for removing oil from the holding chamber to the surface where it may be held in suitable storage such as balloons or salvage tankers.

3,831,388

METHOD FOR LAYING PIPE

Marvin E. Wells, Caldwell, Idaho, assignor to J. A. Terteling & Sons, Inc., Boise, Idaho

Division of Ser. No. 727,979, May 9, 1968, Pat. No. 3,605,419.
This application June 4, 1971, Ser. No. 150,240
Int. Cl. F16l 1/00; E02f 5/22
U.S. Cl. 61—72.1 **4 Claims**



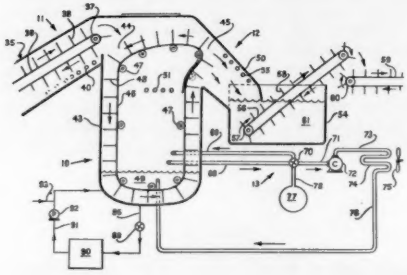
An apparatus for installing a subterranean pipeline in an elongated earthen trench. The apparatus includes a mobile housing operable to be moved along and within the trench. Structure is provided for guiding individual sections of pipe into longitudinal alignment with the pipeline and mechanism is provided for shifting the sections into abutment with the pipeline and for maintaining the pipeline in compression to prevent the individual sections from moving substantially after they are emplaced. The structure and the mechanism are mounted for rectilinear vertical movement within the housing so that the grade of the pipeline may be closely controlled irrespective of the grade of the bottom of the trench. Also included is means for preventing development of suction between the housing and the trench when the latter is moist.

3,831,389

COOLING FOOD PRODUCTS

Samuel P. Lipona, P.O. Box 1064, Delano, Calif. 93215

Continuation-in-part of Ser. No. 190,373, Oct. 18, 1971, and a continuation-in-part of Ser. No. 188,857, Oct. 13, 1971, Pat. No. 3,793,937. This application Dec. 1, 1971, Ser. No. 203,698
Int. Cl. F25d 13/06
U.S. Cl. 62—63 6 Claims



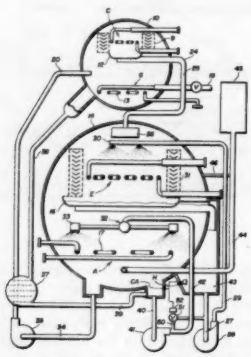
Food products, e.g., freshly killed poultry, meat products, freshly harvested vegetables, etc., are cooled by passing through or dipping in a refrigerant liquid such as a low boiling fluorocarbon. Preferably the apparatus has an inlet liquid seal and an outlet liquid seal to prevent escape of fluorocarbon vapor.

3,831,390

METHOD AND APPARATUS FOR CONTROLLING REFRIGERANT TEMPERATURES OF ABSORPTION REFRIGERATION SYSTEMS

Neil E. Hopkins, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 4, 1972, Ser. No. 312,171
Int. Cl. F25b 15/06
U.S. Cl. 62—101 3 Claims



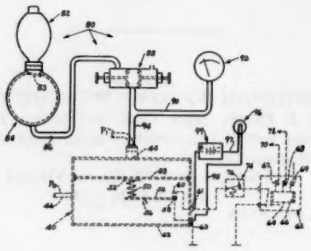
A method and apparatus for producing and controlling hygroscopic salt content in the water refrigerant circuit of an absorption refrigeration system by introducing absorbent solution from the solution circuit to the refrigerant circuit and providing a controlled, predetermined percentage of salt concentration in the refrigerant circuit to lower the freezing point of the water refrigerant.

3,831,391

APPARATUS FOR TESTING THE OPERATION OF THE DEFROST SWITCH IN AN AIR CONDITIONING UNIT

Paul R. Blomstrand, St. Louis County, Mo., assignor to ACF Industries Incorporated, New York, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,820
Int. Cl. F25b 49/00
U.S. Cl. 62—125 24 Claims



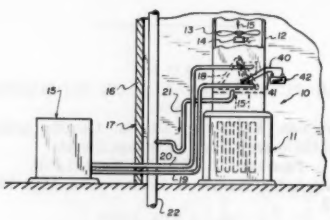
The present invention is an improvement in air conditioning system and comprises apparatus for testing the defrost switch in the air conditioning system. The apparatus comprises a pressure reservoir, means for filling the reservoir with fluid pressure, a pressure gauge, conduit means connecting the reservoir with the pressure gauge and with the defrost switch, and means such as a light or horn indicating successful operation of the defrost switch. Successful operation of the switch is clearly indicated by the light or horn even in noisy environments, and the pressure at which the switch operates can be read on the pressure gauge.

3,831,392

AIR CONDITIONER WITH AIR FLOW SENSOR

Robert O. Hafner, Franklin, and Richard M. Anderson, Smyrna, both of Tenn., assignors to Heil Quaker Corporation, Lewisburg, Tenn.

Filed May 21, 1973, Ser. No. 362,388
Int. Cl. F25d 21/02
U.S. Cl. 62—140 9 Claims

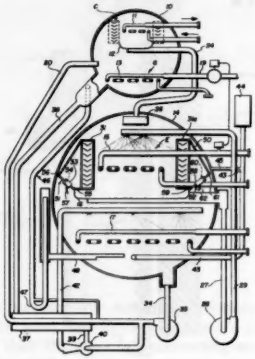


An air conditioning system comprising an air duct for a stream of air flowing therethrough, an air permeable refrigerant evaporator in the duct for chilling the air and an air pressure differential sensor in communication simultaneously with opposite sides of the evaporator for sensing the pressure drop of air passing through the evaporator with the sensor being mounted entirely on the evaporator and supported only thereby. The disclosure also includes the system in which the evaporator is an A-coil and with the sensor being a U-tube with spaced taps therealong located at the apex of the coil with one tube part being on the inside of the A-coil and the other on the outside.

3,831,393
CONTROL ARRANGEMENT FOR ABSORPTION REFRIGERATION SYSTEM

Paul W. Muench, Medford Lakes, N.J., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 26, 1972, Ser. No. 318,133
Int. Cl. F25b *15/06*
U.S. Cl. 62—141 10 Claims

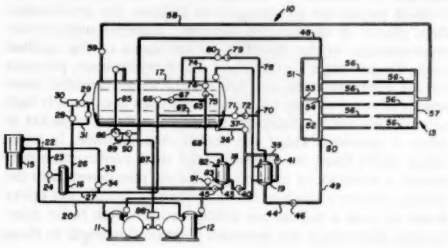


An absorption refrigeration system featuring a damper device between the evaporator and the absorber and controlling the pressure drop of fluid flowing from the evaporator to the absorber.

3,831,394
HEADER DISTRIBUTION SYSTEM FOR ICE RINKS

Richard B. Holmsten, 2127 Dudley Ave., St. Paul, Minn. 55108

Filed Apr. 9, 1973, Ser. No. 349,071
Int. Cl. A63c *19/10*
U.S. Cl. 62—235 3 Claims

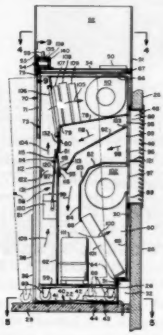


A system for providing a refrigerant to an ice rink, the system including a compressor means for compressing a refrigerant, means for delivering the compressed refrigerant to a low pressure receiver vessel, and means for passing refrigerant condensate from said low pressure vessel to a pair of pumper drum vessels. The rink is provided with a plurality of refrigerant transmitting conduits extending from one end thereof to the other, and with a high pressure header extending across one end of the rink and a low pressure header extending across the opposed end of the rink. The high pressure header is provided with a balance header which couples the opposite free ends of this header element together, and an intermediate line or conduit is also provided which couples the central or mid-portions of the high pressure header and the balance header together.

3,831,395
AIR CONDITIONER

Hans F. Levy, Old Cuthbert and Deer Rds., Cherry Hill, N.J. 08034

Filed May 30, 1973, Ser. No. 365,173
Int. Cl. F25d *23/12*
U.S. Cl. 62—263 13 Claims

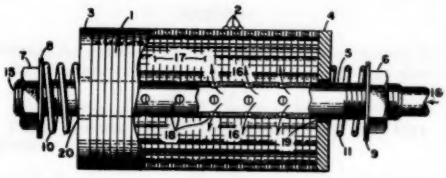


An air conditioner including a cabinet located in a building space to be conditioned adjacent to a building wall having an opening, the cabinet having a pair of outside air inlets and an outlet communicating through the wall opening, and inferiorly located condenser in the cabinet in a path of cooling air between one inlet and the outlet, the cabinet having a room air inlet and a conditioned air outlet, and a superiorly located evaporator interposed in the path of fluid movement between the room air inlet and conditioned air outlet. The installation is uniquely advantageous for use in existing buildings without altering structure.

3,831,396
SELF-REGULATING THERMAL PROTECTION SYSTEM FOR HEATED SURFACES

Coleman Dup. Donaldson, Princeton, and Richard S. Snedeker, Cransbury, both of N.J., assignors to Aeronautical Research Associates of Princeton, Incorporated, Princeton, N.J.

Continuation-in-part of Ser. No. 173,151, Aug. 19, 1971, abandoned. This application July 25, 1972, Ser. No. 275,059
Int. Cl. F25b *19/00*
U.S. Cl. 62—467 35 Claims

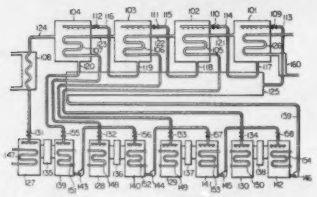


A system for providing protective cooling for machine surfaces which, in the absence of such cooling, would otherwise be damaged on exposure to a high heat flux, and in which such cooling is initiated and regulated by the surface itself through its novel construction and the behavior of the materials of which it is made. This cooling action is achieved through the use of surface materials having different thermal expansion characteristics which are arranged is such a way that the exposure to a high heat flux on one side of the surface causes the release through the surface of a coolant fluid contained under pressure on the other side.

3,831,397
MULTI-STAGE ABSORPTION REFRIGERATION SYSTEM

Gohee Mamiya, 11-6 Mitsuzawa Kamicho, Kanagawa-ku, Yokohama, Japan

Continuation-in-part of Ser. No. 180,640, Sept. 15, 1971, Pat. No. 3,742,728. This application May 1, 1973, Ser. No. 356,102
Int. Cl. F25b *15/06*
U.S. Cl. 62—476 6 Claims



There is provided an improved multi-stage absorption refrigeration system employing a highly concentrated solution of refrigerant to obtain an increased refrigeration effect relative to the quantity of input heat to the system as compared with a conventional system, comprising a multi-stage regenerator-condenser system and at least a one-stage evaporator-absorber system provided with a pressure elevating device therebetween.

3,831,398
ORNAMENT WITH SECURING MEANS

John N. Davis, Sr., Ten Stanley Oval, Westfield, Fayetteville, N.C. 07090

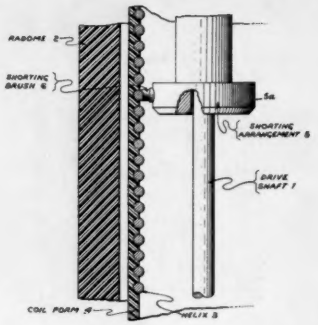
Filed Apr. 4, 1972, Ser. No. 240,989
Int. Cl. A44c *25/00*
U.S. Cl. 63—2 1 Claim

A small button like device is adapted to receive an ornament on one side and is contoured on the other side. This other side is provided with means for detachably securing same to the exposed navel of a wearer by a combination of suction, friction and adhesion.

3,831,399
DRIVE SHAFT CONFIGURATION FOR A HIGH VOLTAGE ANTENNA TUNING MECHANISM

Charles P. Majkrzak, Nutley, and Stephen F. X. Sladowski, Bayonne, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Feb. 9, 1973, Ser. No. 330,926
Int. Cl. F16c *1/00*
U.S. Cl. 64—1 R 13 Claims



There is disclosed dielectric material drive shaft constructions designed for use particularly in high electric-field potential environments such as in driven tuning mechanism of a high voltage helical transmitting antenna, which shaft constructions are capable of maintaining operation under unusually high mechanical loads requiring both rotational and axial movement. A plurality of elongated common-stock pieces of layered epoxy or silicon-bonded fiberglass are shaped cross-sectionally to be united predeterminably into a unitary form via longitudinally running bonds of epoxy adhesive. The unitary form cross-section is a "soft" polygon, for example a rounded-off triangle or square, wherein the individual pieces are so arranged as to have the interlaminar shear planes of the layered dielectric material substantially perpendicular to the direction of the force of the applied loads. To provide a shaft surface which resists wear, prevents surface contamination, and has nontracking properties most beneficial in preventing arcing and creepage in extremely high potential electric gradient environments, a sleeve or jacket of teflon is provided about the shaft's outer surface. In cases where shafts loads are excessive, the shaft construction may include a multiplicity of strong dielectric pins driven thru the unitary structure, each across a successive interfacing epoxy bond, to form a helical pin configuration which resist interlaminar shear loads and provides additional strength to these bonds.

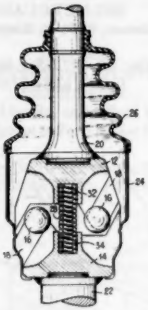
3,831,400
CONSTANT-VELOCITY JOINT

Gerard Morin, Bondy, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Apr. 9, 1973, Ser. No. 349,139
Claims priority, application France, Apr. 20, 1972, 72.13906
Int. Cl. F16d *3/30*
U.S. Cl. 64—21 3 Claims

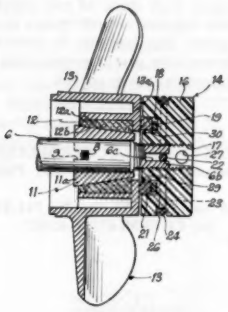
A constant-velocity joint of the type having torque transmitting members in the form of two interlacing forks and bearing balls situated between the prongs of the fork, the balls being movable in grooves provided in the mutually opposite surfaces of the fork prongs. To prevent relative axial motion of

the forks, a flexible tie has each of its ends connected to a respective fork in the central region of the joint. In a preferred embodiment, the tie is a spring steel wire coiled to have closely wound turns. When the joint is bent, the tie is curved in the



region of its center with sufficient flexibility to prevent jamming of the joint. The flexible tie is more economical to manufacture than the prior art connecting means such as those including a ball and socket device whose center acurately coincides with the joint's bending center.

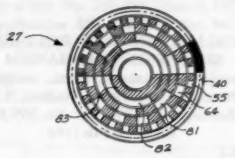
3,831,401
SLIP CLUTCH FOR OUTBOARD MOTOR
Mathew Hurwitz, 63 Oakland Ave., Auburndale, Mass. 02166
Filed Aug. 30, 1973, Ser. No. 392,982
Int. Cl. F16d *43/20*
U.S. Cl. 64—30 R **9 Claims**



An improved slip clutch for outboard motors which prevents damage to the propeller and drive train and which eliminates shear pin breakage. The clutch friction mechanism is incorporated within a propeller hub while the mechanism for maintaining the clutch pre-load is housed within a special hub nut designed for ease of calibration and resistance to corrosion and abrasion.

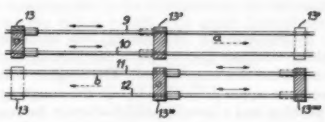
3,831,402
KNITTING MACHINE ENCODER
Ralph H. Schuman, Euclid, Ohio, assignor to The Warner and Swasey Company, Cuyahoga County, Ohio
Filed Oct. 27, 1971, Ser. No. 192,984
Int. Cl. D04b *15/78*
U.S. Cl. 66—50 R **5 Claims**

An improved knitting machine includes an encoder which provides signals which vary with variations in the relative position of a needle cylinder and associated feeders. The encoder includes code tracks for providing binary coded needle count signals, feeder count signals, and revolution count signals. A



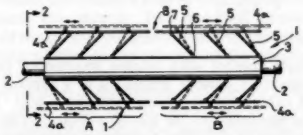
control system receives these binary coded signals and effects the knitting of a selected one of a plurality of patterns. A pattern selector switch is operable to vary the selected pattern.

3,831,403
DEVICE FOR PRODUCING SIMULTANEOUSLY TWO SEPARATE FABRICS RIB ON THE SAME HEAD OF A RIB KNITTING MACHINE WITH TWO NEEDLE BEDS
Karel B. Bruelemans, Gentbrugge, Belgium, assignor to Fabrique Nationale Herstal S.A. en abrege FN, Herstall-lez-liege, Belgium
Filed Feb. 27, 1973, Ser. No. 336,189
Int. Cl. D04b *15/52*
U.S. Cl. 66—126 R **7 Claims**



The device is adapted to be attached to a conventional flat knitting machine with two V-shaped needle beds and includes a movable thread catcher for catching threads between the needle beds and drawing them downwardly, a thread cutter having open blades between which the threads are drawn downwardly, and control means programmed by the movable thread catcher and the thread cutter for moving the thread catcher between a lowered and a raised position and for actuating the thread cutter to cut the threads drawn downwardly by the thread catcher.

3,831,404
WEB SUPPORTING DRUM
Valentin Appenzeller, Am Hagelkreuz, Germany, assignor to Eduard Kusters Maschinenfabrik, Gladbacher Strasse, Germany
Filed Aug. 14, 1972, Ser. No. 280,431
Claims priority, application Germany, Aug. 14, 1971, 2140891
Int. Cl. B05c *3/04*
U.S. Cl. 68—199 **4 Claims**



A drum for supporting a textile web or the like wrapped around the drum is formed by a cylindrical series of bars arranged to form a drum-like contour for carrying the web. The

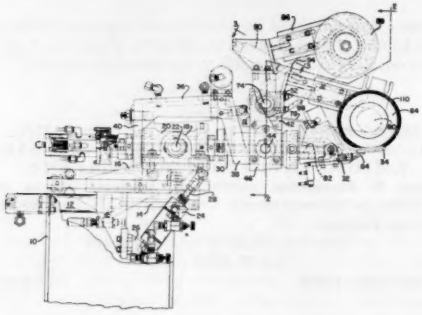
bars move radially and axially while rotating as a series in a manner restraining lateral shifting of the web while radially agitating the web more or less as desired.

3,831,405

ROUGHING MACHINE WITH ROUGHING TOOL SHARPENING MECHANISM

Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Sept. 24, 1973, Ser. No. 399,881
Int. Cl. C14b *1/44*
U.S. Cl. 69—6.5 **15 Claims**



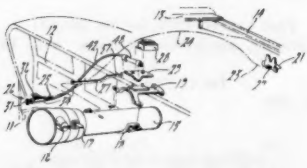
A mechanism for sharpening the roughing tool of a roughing machine. The roughing machine includes a roughing tool mounted to a rougher unit. The rougher unit is moveable between an upper position wherein the roughing tool is in an idle position and a lower position wherein the roughing tool is in a roughing position and is effective to rough the upper margin of a shoe assembly. A sharpening tool is mounted for movement between an idle position wherein it is spaced from the roughing tool and a working position wherein it is in engagement with the roughing tool. A positioning device is effective to bring the sharpening tool to its working position when the roughing tool is in its idle position.

3,831,406

REMOTE CONTROL LATCH RELEASE MECHANISM

Harold C. Gebhard, Livonia, and Alfred M. Keller, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 21, 1973, Ser. No. 372,444
Int. Cl. B60r *25/04*; **E05b** *65/19*
U.S. Cl. 70—1.5 **12 Claims**



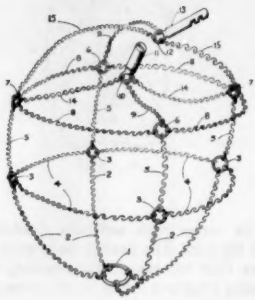
A remote control latch release mechanism comprising a handle assembly slidably journalled in a support means and having a cable coupler means receiving a pair of cable elements for movement by the handle assembly in latch releasing direction. One of the cable elements is connected to a release lever of a latch mechanism located remotely from the handle assembly and the other cable element is coupled to a locking device operable to hold it and thereby the handle assembly against movement in latch releasing direction. A disabling means renders the handle assembly inoperative against latch releasing actuation upon the other cable element being severed between the coupler means and the locking device.

3,831,407

HELMET GUARD

Lloyd Archelle Coleman, 6836 E. Kingston Dr., Tucson, Ariz. 85710

Filed Dec. 26, 1972, Ser. No. 318,549
Int. Cl. E05d *73/00*
U.S. Cl. 70—18 **4 Claims**



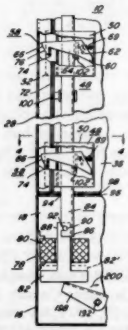
The helmet guard of the present invention is especially adapted to be used for head helmets of the type worn by the rider of a motor vehicle, such as a motorcycle. It comprises a number of lengths or strands of supple metal material, such as chain, interconnected in such a manner so as to form a cage-like receptacle into which the helmet may be placed and the shape of which conforms to that of the helmet so that the same is enveloped thereby. The top of the guard is closed by a pair of triangular shaped flaps made of said supple material or chain when locked together at their apexes provide a secure closure for the guard. The flaps may be passed over a frame member (or other suitable part) from opposite sides thereof, and then locked together at their apexes.

3,831,408

ELECTRICAL LOCKER MEANS

Bernard Featherman, 2100 Spruce St., Philadelphia, Pa. 19103

Filed Mar. 16, 1973, Ser. No. 341,924
Int. Cl. E05b *47/02*, *65/02*
U.S. Cl. 70—84 **6 Claims**



An electrical locker means including a locker structure having a chamber, door means having open and closed positions

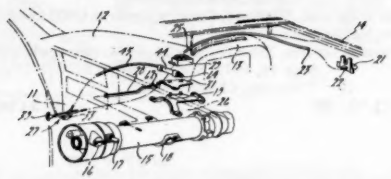
for controllably enclosing said chamber, an electrically actuated locking means having locked and release positions for locking said door means in its closed position and controllably releasing said door means for placing same in its open position, and lock control means for selectively energizing the electrically actuated locking means for releasing the locking means.

3,831,409

REMOTE CONTROL HOOD LATCH RELEASE MECHANISM

Harold C. Gebhard, Livonia, and Alfred M. Keller, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 9, 1973, Ser. No. 358,776
Int. Cl. B60r 25/04; E05b 65/19
U.S. Cl. 70—241 12 Claims



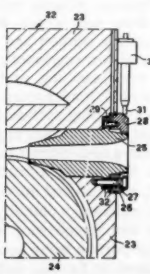
A remote control hood latch release mechanism having an actuator means adapted to be coupled to a latch mechanism release lever by a first cable means for actuating the latch mechanism from a remote location. A second cable means is coupled to the actuator means and extends to a locking means that is operable to immobilize the second cable means to prevent movement of the actuator means in unlatching direction.

3,831,410

SAFETY DEVICE FOR ROLLING MILLS

Ilario Properzi, Via Cosimo Del Fante, 10, Milan, Italy

Filed July 9, 1973, Ser. No. 377,303
Claims priority, application Italy, July 22, 1972, 27322/72
Int. Cl. B21b 39/14, 35/00; F16p 7/00
U.S. Cl. 72—5 6 Claims



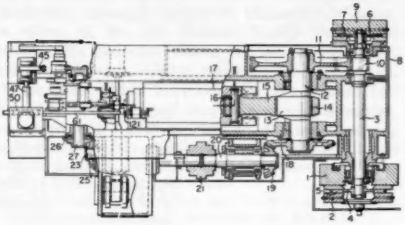
In a rolling mill, particularly a multistand rolling mill for the drawing of metal rods and the like, the improvement consisting in a safety device provided on at least the last stand and consisting of the shearable means securing the outlet guide for the rolled material to the same stand, whereby when the shearable fixing means are subjected to a thrust greater than a predetermined value, the outlet guide is separated from the rolling stand and engages switch means by which the drive to the rolling stands is disengaged.

3,831,411

FULLY AUTOMATIC UPSETTING MACHINE

Hiroshi Sakai; Hisateru Yamashita, and Toshihiro Tanaka, all of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo-To, Japan

Continuation of Ser. No. 260,895, June 8, 1972, abandoned.
This application Aug. 27, 1973, Ser. No. 391,595
Claims priority, application Japan, June 18, 1971, 46-43272
Int. Cl. B21g 3/32
U.S. Cl. 72—10 8 Claims



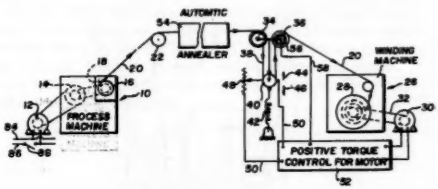
Upsetting machine, a kind of horizontal mechanical press, wherein a long-stock bar material including wire material being fed is successively cut to a sized material with a predetermined length in the first station, such a sized cut material is held by a transfer mechanism in the second station, the transfer mechanism positions the cut material directly in front of an upsetting die in the third station, the cut material is upset by the die and a punch, the upset formed article is removed from the die, and thus the entire operation is performed fully automatica'ly in a single machine.

3,831,412

COORDINATED STOPPING OF TAKE-UP AND PROCESS MACHINES

Ben Bravin, New York, N.Y., assignor to Cook Machinery Company, Division of Wire Technology & Machinery Company, Hackensack, N.J.

Filed July 13, 1973, Ser. No. 378,989
Int. Cl. B21c 1/12
U.S. Cl. 72—19 12 Claims

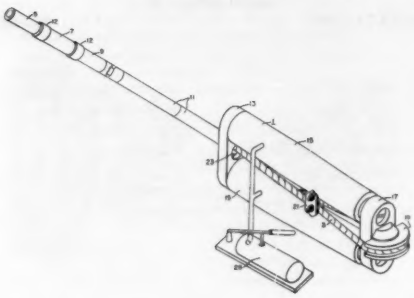


Winding machines that spool wire delivered from a processing machine, such as a wire drawing apparatus, having a speed control that passes a loop of wire around a dancer roll that actuates the control. This invention coordinates the stopping of the processing machine and the winding machine by providing a brake to the rotation of the winding machine spool. This brake applies a negative torque that is grossly set to stop the rotation of the winding machine at a decrease rate which is greater than the decrease rate of the processing machine. A positive torque of the winding machine drive is applied during the brake actuation and continues to supply a positive torque under the control of the dancer roll. The stopping rate of the winding machine is thus coordinated to the stopping time of the processing machine.

3,831,413
TUBE EXPANDER

Raymond H. Glatthorn, St. Petersburg, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1972, Ser. No. 302,951
Int. Cl. B21d 15/06
U.S. Cl. 72—59 8 Claims

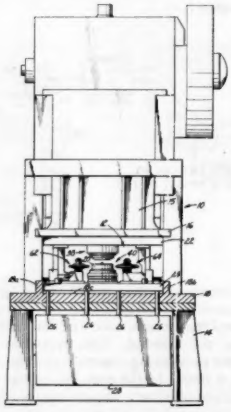


A tube expander comprising an elastomer bushing which expands outwardly when compressed between two bushings pulled together by a cable, which is pulled through a plurality of short lengths of tubing capable of folding against each other when the cable is slack, allows the tube expander to fit through manways and into corners of channel heads of heat exchangers to expand the tubes a predetermined distance from one end thereof.

3,831,414
MEANS FOR MAKING PULLEYS

John W. Haswell, and Stanley A. Haswell, both of c/o Master Craft Engineering, Inc., 39555 Express Hwy., Belleville, Mich. 48111

Filed July 9, 1973, Ser. No. 377,643
Int. Cl. B21d 22/16
U.S. Cl. 72—82 15 Claims

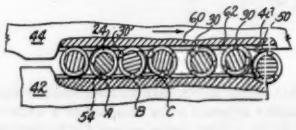


An apparatus and method are provided for forming a pulley including a pulley groove from a cup-shaped metal blank having an axially extending wall. The blank is crushed between axially closing dies which are used in combination with forming rolls arranged to apply radially inwardly directed rolling pressure to the wall of the blank. The forming rolls include rough and finish rolls which are carried by cam actuated slide assemblies arranged to move the rough roll into the blank wall in advance of the finish roll in a working operation so as to partially form a pulley groove and to maintain the finish roll in the partially formed groove in an idling operation. Thereafter, the rough roll is disengaged from within the partially formed pulley groove and the finish roll is advanced to the root of the partially formed groove and into a working operation. The axially closing die movement includes a lost motion dwell during which the dies are moved as a unit in their final relative position together with the finish roll to assure the complete radial advance of the finish roll to assure the complete radial advance of the finish roll and the truing of the pulley being formed.

3,831,415
SELF TAPPING FASTENER AND METHOD AND DIES FOR MAKING SAME

Edwin J. Skierski, Stratford, Conn., assignor to USM Corporation, Boston, Mass.

Division of Ser. No. 256,370, May 24, 1972. This application Sept. 18, 1973, Ser. No. 398,317
Int. Cl. B21b 3/06
U.S. Cl. 72—88 3 Claims



A self tapping threaded fastener, the method of making same and the rolling dies therefor wherein said fastener is adapted for assembly with a member in which a standard internal thread is formed by the fastener and in which a zero running torque or controlled prevailing torque is established between said fastener and member. A plurality of thread forming lobes are disposed on an otherwise standard, substantially fully formed thread on the tapered work entering end, wherein predetermined lobes on said tapered end proximate the shank portion are rolled such that their ultimate projection is within the envelope of the imaginary projection of the convolution of the shank thread toward the tip of said fastener. The method of making said fastener includes rolling a substantially continuous thread from said shank portion throughout said tapered work entering portion and simultaneously forming spaced apart thread forming lobes superimposed upon said thread in said work entering portion, then subsequently rerolling said threaded shank portion and said predetermined lobes on the work entering portion to the cylindrical thread convolution of said shank portion, as projected.

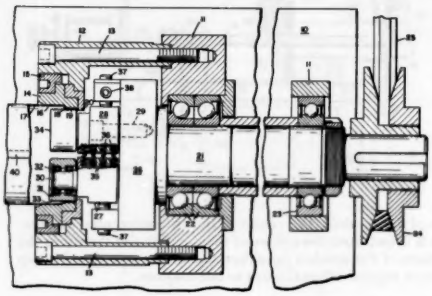
The dies for rolling said fastener include a first, and second rolling dies, said dies having a fastener entrance end and a fastener exit end, and disposed intermediate said ends thread forming surfaces including a plurality of parallel thread crest forming grooves and thread root forming ridges having a shank forming flat portion being bounded along one edge by an upwardly inclined tip forming surface, said first rolling die being the primary rolling die and having a shank and tip forming section including a lobe forming section wherein a plurality of regularly spaced lobe forming pockets are disposed in said thread forming grooves and ridges in said tip forming surface, a reroll support section wherein said thread forming surfaces match said shank forming flat portion and a release section, said reroll support section of a predetermined rolling length so as to reroll a predetermined number of said thread forming lobes, and a said second rolling die having shank and tip forming sections, and a reroll section so disposed as to reroll a predetermined number of said thread forming lobes.

3,831,416

NECKING DIE ASSEMBLY WITH INTERNAL ROLLERS

Wayne F. Wolfe, Belmont, Calif., assignor to United Can Company, Hayward, Calif.

Filed Jan. 4, 1973, Ser. No. 320,896
Int. Cl. B21d 3/02
U.S. Cl. 72—117 3 Claims



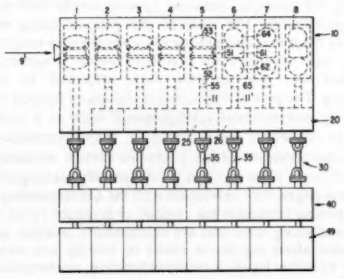
A die assembly for forming a reduced-diameter neck on the end of a cylindrical can body having a side lap wherein no orientation of the can lap relative to the necking die is required. The can body is pushed into a ring necking die and one or more rollers roll along the inside of the can body to press the can body end outwardly against the inwardly facing reduced-diameter die surface of the necking die, the rollers being yieldable at all times away from the die so that they may roll over the can lap wherever it may be encountered.

3,831,417

STRETCH-REDUCING ROLLING MILL

Hans-Georg Ritter, Rheydt, and Ulrich Weiser, Monchengladbach, both of Germany, assignors to Wean United, Inc., Pittsburgh, Pa.

Filed Oct. 10, 1973, Ser. No. 404,944
Int. Cl. B21b 31/08, 35/12
U.S. Cl. 72—235 3 Claims



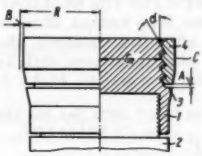
The disclosure of the application relates to a stretch-reducing rolling mill for tubes, including a number of tandemly arranged mill stands, and individual gear-motor drives for each stand. The mill stands include frames or supports which in an interchangeable manner receive either a three-roll head or a four-roll head, the former having a single drive shaft and the latter two spaced apart drive shafts. Between the gear motors and the stands there is provided for each stand distribution gear units having two output drive shafts, one being employed to drive the three-roll head and both to drive the four-roll head.

3,831,418

EXTRUSION DIE ASSEMBLY

Evdokim Stepanovich Bogdanov, Volzhsky prospekt 45, kv. 90, Kuibyshev; Alexandr Sergeevich Alexandrov, Vyazemskaya ulitsa, 6, kv. 51, Moscow; Vadim Dmitrievich Schegolevatykh, Sadovaya ulitsa, 172, kv. 3, Kuibyshev; Vyacheslav Ivancvich Saveliev, Spartakovskaya ulitsa, 16, kv. 7, Moscow; Mikhail Fedorovich Zakharov, ulitsa Tolbukhina, 12, kv. 84, Moscow; Jury Nikolaevich Alexandrov, 3 Prudny pereulok, 11/13, kv. 93 "A", Moscow; Gennady Mikhailovich Korsetsky, Tashkentsky pereulok, 3, kv. 2, and Arnold Arkadievich Kucher, Prospekt Metallurgov, 71, kv. 85, both of Kuibyshev, all of U.S.S.R.

Continuation of Ser. No. 205,649, Feb. 7, 1971, abandoned.
This application May 15, 1973, Ser. No. 360,551
Claims priority, application U.S.S.R., May 29, 1968, 1252825
Int. Cl. B21c 25/00
U.S. Cl. 72—273 3 Claims



A die assembly for extrusion molding of profile shapes is rigidly mounted on the press ram and includes two coaxially arranged parts. The first part is a holder having the free cylindrical end portion provided with an external thread of which the axial extent is limited by a radial shoulder. The other part is a cylindrical nut threaded onto the free end portion of the holder, so that an axial gap is left between the face end of the nut and the radial shoulder of the holder, with this gap being intended to be taken up in the course of an extrusion mold operation, whereby the die assembly provides for a variation of the external diameter thereof, and the cylindrical shape of the external periphery of the die assembly being unaffected by this variation of the diameter.

3,831,419

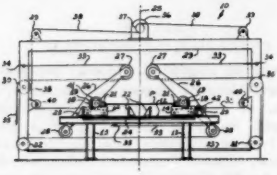
MACHINE FOR TRANSVERSELY CURVING ELONGATED PANELS

Gerald H. Leese, Pierrefonds, and David H. Kennedy, Baie D Urfe, Quebec, both of Canada, assignors to Dominion Bridge Company Limited, Quebec, Canada

Filed Aug. 7, 1972, Ser. No. 278,211
Claims priority, application Canada, July 5, 1972, 146427
Int. Cl. B21d 5/00
U.S. Cl. 72—298 16 Claims

A pair of elongated, rotatable torque members are mounted in juxtaposed relation on a frame and are provided with longitudinal channels to receive longitudinal edges of a panel which is to be transversely curved. Winch-actuated cables are connected to levers fixed to the torque members for partially

rotating the same in opposite directions, so that a panel held in the channels becomes transversely curved. As this occurs, movable mounting of the torque members on the frame permits them to move closer together as an incidental function of



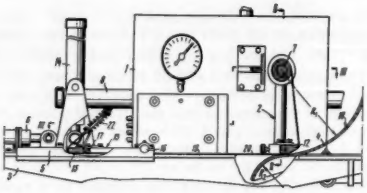
a decreased transverse dimension of the curved panel. Other winch-actuated cables return the torque members to their initial position after the curved panel is removed therefrom. The torque members may be either parallel to produce half-cylinders or convergent/divergent to produce half-cones.

3,831,420

METHOD OF BENDING HEAT EXCHANGER SECTIONS AND A MACHINE FOR THE REALIZATION THEREOF

Gennady V. Byzov, Stary Vodopoi, ulitsa Chapaeva, 20/4; Ilya V. Valdman, ulitsa Grazhdanskaya, 48e, kv. 8; Boris Y. Mazurovsky, ulitsa Teatralnaya, 49/1, kv. 83, and Ivan E. Yakibjuk, ulitsa Moskovskaya, 54, kv. 10, all of Nikolaev, U.S.S.R.

Filed June 7, 1971, Ser. No. 150,394
Int. Cl. B21d *11/04*
U.S. Cl. 72—305 **3 Claims**



A method of bending heat exchanger sections and a machine for the realization thereof. The method consists in that the sections are compressed longitudinally to a critical state preceding the loss of stability by the tube material, after which the section is shaped in the desired direction.

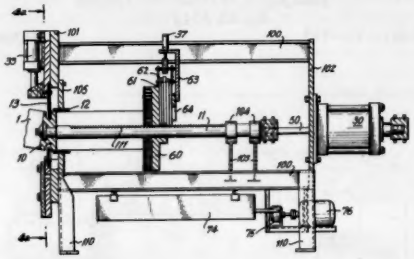
3,831,421

CONDUIT BENDING MACHINE

Joseph A. Koger, Jr., and James L. Wade, both of Martinsville, Va., assignors to Koger & Wade Manufacturing Corporation, Martinsville, Va.

Filed June 26, 1972, Ser. No. 266,460
Int. Cl. B21d *9/14*
U.S. Cl. 72—307 **7 Claims**

A machine for forming integral bends in conduit is provided with a circular die-block carrying a circumferential groove on its outside diameter. The conduit to be formed is slipped over the die-block and four blades converging toward the center of the conduit form a circumferential indentation in the conduit in the plane of the circumferential groove of the die-block. The die-block is then caused to move relative to an external die member, entraining the indentation in the conduit and crimping the entrapped material against the undeformed sur-



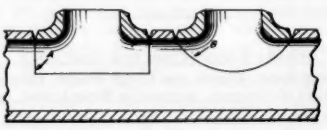
face of the conduit. The center of the circumferential indentation is offset from the center of the conduit and therefore the sections of the conduit on either side of the completed crimp have an angular offset relative to one another.

3,831,422

METHOD OF PRODUCING TWO PIPE CONNECTIONS FROM A SINGLE FORGING

Charles H. Moore, 645 Matanzas Ct., Fort Myers Beach, Fla. 33931

Filed July 20, 1973, Ser. No. 381,095
Int. Cl. B21d *28/00*
U.S. Cl. 72—340 **12 Claims**



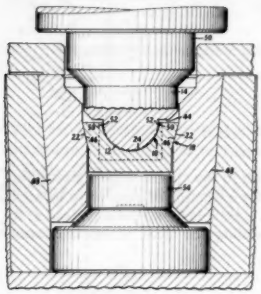
A novel and relatively inexpensive process is provided for making high quality metallic connector members for metal conduits, pipes, pressure vessels, etc. the same frequently weighing, for example, between approximately 1376 pounds and approximately 138 pounds; the process being characterized by the initial and practically simultaneous rough-forming of a pair of connector members which is subsequently split, and the split articles then subjected to further processing. The pair of connector members so formed may be of entirely conventional configuration, such as a commonplace Tee connector, for example, or, in the alternative, of a unique conformation which possesses certain advantages in that the base or plate element is substantially rectangular with peripheral edges, for connection with the corresponding edges of the opening formed in the conduit or pressure vessel, which are formed along lines that are substantially straight, and for this reason alone are much easier to line-up and weld into position by either hand or machine welding, as compared with prior art practices which, for the most part involve peripheral edges to be lined-up and welded that delineate oval or saddle shapes. This rough-forming of a pair of connector members (to be followed by additional operations to obtain two finished connector members) is performed on a (heated) work-piece wherein the areas of displacement are of such size as to permit the same to be used over a wide variety of sizes of finished connector members, as distinguished from the prior art methods of flueing from a flat plate or drop-forging wherein only one finished size is obtainable, which makes it necessary to maintain a very large stock of die sizes.

3,831,423

METHOD OF MAKING GOLF BALL MOLDS

Robert A. Brown; John W. Jepson, both of Marion, Mass., and Herbert W. Lyon, Escondido, Calif., assignors to Acushnet Company, New Bedford, Mass.

Filed Jan. 26, 1973, Ser. No. 326,900
Int. Cl. B21k 5/20
U.S. Cl. 72—358 5 Claims



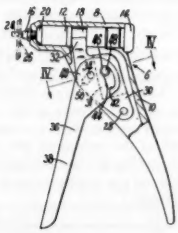
A method of making molds for the production of golf balls is disclosed. A hob is made of approximately the same dimensions as half of the finished golf ball and then a mold is formed from the hob.

3,831,424

PLIERS TYPE BLIND RIVETING TOOL

Peter A. James, Walsall, England, assignor to USM Corporation, Boston, Mass.

Filed July 30, 1973, Ser. No. 383,667
Claims priority, application Great Britain, Feb. 24, 1973, 9162/73
Int. Cl. B21j 15/34
U.S. Cl. 72—391 8 Claims



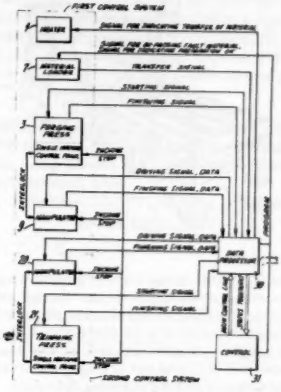
A blind-riveting pliers tool has an intermediate member pivoted by an operating handle to act on a jaw case in tensioning a mandrel. The arrangement is such that as the tool is operated by pulling the handle away from the workpiece which is to receive the rivet, mechanical advantage increases and there is a reduced tendency for the tool to "jump" when the stem of the mandrel breaks.

3,831,425

FULLY AUTOMATIC FORGING PRESS

Masaaki Kita, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo-To, Japan

Filed May 1, 1973, Ser. No. 356,123
Int. Cl. B21j 11/00
U.S. Cl. 72—405 4 Claims



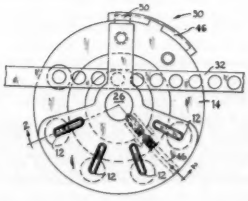
This forging press is adapted to operate fully automatically, based on complete control by computers, the process including the heating of a material to be forged, introduction of the heated material, transferring successively to a plurality of metal molds provided in the body of the forging press and reversing of the material, removing the forged material from the forging press, and performing finishing work after the material has been carried into a trimming press.

3,831,426

PROGRESSIVE STAMPING DEVICE HAVING WORK STATIONS IN A CURVILINEAR PATH

Robert Hakner, 76-78 Vernon Ave., Brooklyn, N.Y. 11206

Filed Sept. 29, 1972, Ser. No. 293,413
Int. Cl. B21d 43/00
U.S. Cl. 72—405 11 Claims



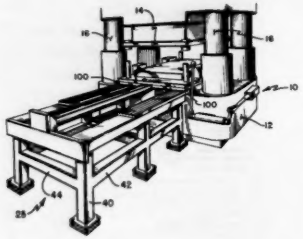
An automatic stamping machine for stamping by means of punches of metal articles from a feed strip and performing various work operations thereon in which the work stations are mounted in a curved pattern on the periphery of at least one or more interacting rotatable segments. The work path thus follows a sinuous line. The machine is provided with a central guide shaft that guides both the vertical and lateral movement of the mechanism. In addition, the central shaft serves as a guide for auxiliary devices, for example, such as the punch knock out and switching mechanisms. The mechanism has a top and bottom set of rollers engaging the central shaft and a set of needle bearings which eliminate the tendency toward binding of the mechanism.

3,831,427

PRESS FEED TABLE

Ronald G. Lee, Medford, Minn., assignor to Owatonna Manufacturing Co., Inc., Owatonna, Minn.

Filed Dec. 15, 1972, Ser. No. 315,330
Int. Cl. B21j *13/00*
U.S. Cl. 72—448 **5 Claims**



The press feed table in the form of a table structure having two table members at the upper surface thereof and adjustable legs supporting the same to mount wear plates which provide for the sliding movement of a die support shoe thereon. A simplified and single hydraulic actuator of the linear type will move the die shoe into and out of engagement with the press for a normal working and die changing operation.

3,831,428

COMPOSITE WIRE DRAWING DIE

Robert H. Wentorf, Jr., Schenectady, and William A. Rocco, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 26, 1973, Ser. No. 345,178
Int. Cl. B21c *3/00*
U.S. Cl. 72—467 **10 Claims**

Composite wire drawing die construction is described in which a centrally-located mass of diamond, cubic boron nitride or a polycrystalline mixture thereof defines at least the throat of the wire drawing hole, the mass being flanked or girded by at least one mass of metal bonded carbide that is directly bonded thereto. The composite is readily ground into the form of a solid of revolution. In the preferred construction (for dies for drawing 0.008 inches diameter wire and larger) a composite assembly includes at least one high strength metal ring that is press fitted around a composite body or sub-assembly comprising a polycrystalline mass of diamond girded by a metal-bonded carbide jacket.

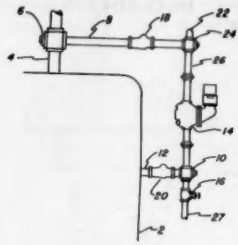
3,831,429

METHOD AND APPARATUS FOR TESTING LOW WATER FUEL CUT-OFF SWITCHES

Leopold J. Kmiecik, Lincolnwood, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 3, 1972, Ser. No. 277,523
Int. Cl. G01f *25/00*
U.S. Cl. 73—1 R **9 Claims**

A method and apparatus are disclosed for use in testing or inspecting low water fuel cut-off switches used with hot water heating boilers. The low water fuel cut-off switches employ floats which are positioned in float chambers between equalization pipes connected to the hot water boiler. To enable inspection, flow of water though the equalization tubes is restricted at the same time a drain valve is opened below the



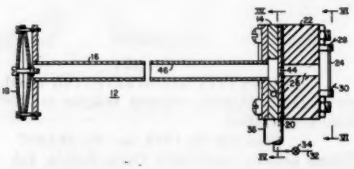
float chamber in the cut-off switch. Restriction of flow makes it possible for a vacuum release valve located above the float chamber to open and dump the water out of the float chamber thereby enabling the float to operate associated indicator means.

3,831,430

DEVICE FOR MEASURING DENSITY AND DEW POINT OF A GAS

Frederick A. Azinger, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 16, 1972, Ser. No. 263,562
Int. Cl. G01n *9/36, 25/66*
U.S. Cl. 73—17 A **5 Claims**



This invention uses a vortex tube or Hilsch tube in combination with a thermocouple to determine the apparent molecular weight or density of a gas mixture and the dew point of the gas mixture. The thermocouple has a flat planar configuration with one side highly polished for accurately indicating the dew point. The cold gas which is extracted from the Hilsch tube is used to cool the polished thermocouple until frost or dew is formed on the thermocouple. This indicates the dew point of the gas surrounding the polished surface of the thermocouple. The temperature of the thermocouple continues to drop until it indicates the exhaust temperature of the cold gas from the Hilsch tube. This output temperature is a function of the pressure and temperature of the incoming gas and the density of the gas. Thus if the incoming gas temperature and pressure are held constant the exhaust gas temperature is a function of the density of the gas mixture.

3,831,431

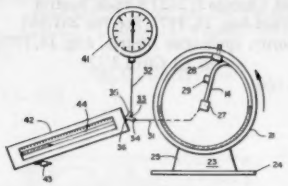
ADJUSTABLE STATIC PRESSURE OR VACUUM SOURCE AND INDICATOR

Billy D. Morris, Rd. 1, Red Lion, Pa. 17356

Filed May 11, 1973, Ser. No. 359,240
Int. Cl. G01l *27/00*
U.S. Cl. 73—4 R **9 Claims**

Device and method for checking and calibrating vacuum and low pressure pneumatic gauges and differential pressure

switches by utilizing a helix of tubing partially filled with a liquid and then rotated about its axis to a new position as a



readily adjustable, highly accurate, constant source of vacuum or low pressure.

3,831,432

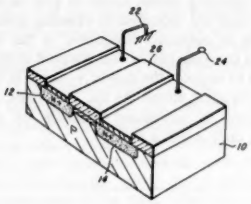
ENVIRONMENT MONITORING DEVICE AND SYSTEM

Paul F. Cox, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 5, 1972, Ser. No. 286,522

Int. Cl. G01n *31/06*; H01l *9/00*

U.S. Cl. 73—23 **17 Claims**



A monitoring system for characterizing the presence and concentration of selected substances in an environment is provided. The system includes a set of sensors which provide outputs responsive to substances adsorbed from the environment, at least one of the sensors having an output which differs from others in the set in its response to at least one substance being monitored. Preferably the sensors comprise adsorption field effect transistors respectively having chemically specific films in the gate region to enable preferential adsorption of preselected substances.

3,831,433

APPARATUS FOR MEASURING THE DENSITY OF A FLUID BY RESONANCE

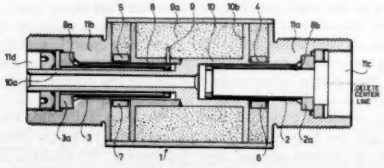
Sandor Kovacs, and Gyorgy Felsovalyi, both of Budapest, Hungary, assignors to Merestechnikai Kozponti Kutato Laboratorium, Budapest, Hungary

Filed Nov. 28, 1972, Ser. No. 309,989

Claims priority, application Hungary, Dec. 7, 1971, ME 1448

Int. Cl. G01n *9/00*

U.S. Cl. 73—32 A **20 Claims**



Apparatus for measuring the density of a fluid, and if desired also its mass flow rate, comprises a sensor unit having in unitary assembly a pair of coaxial resonant cylinders each anchored at one end and extending toward each other at their free ends. One resonant cylinder is in a closed chamber and the other provides a passageway for the flow therethrough of the fluid to be measured. The sensor has means to excite vibrations in the resonant cylinders and means for sensing vibrations in the resonant cylinders. The exciting means and the sensing means of each resonant cylinder are in a feedback loop with an amplifier, and means are provided to compare the outputs of the amplifiers and to derive a signal indicative of the density of the tested fluid. In addition, the flow rate of the fluid is metered and a multiplier responsive to the density and flow rate signals derives a signal indicative of mass flow.

3,831,434

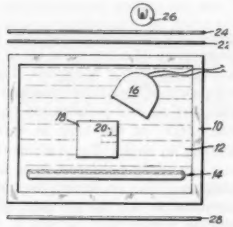
METHODS AND APPARATUS FOR IMAGE DISPLAY OF SOUND WAVES AND UTILIZATIONS THEREOF

Pal Greguss, Long Island, N.Y., assignor to Vari-Light Corporation, Cincinnati, Ohio

Filed Mar. 23, 1972, Ser. No. 237,404

Int. Cl. G01n *29/04*

U.S. Cl. 73—67.5 H **19 Claims**



A device employing a piezo-optic cell having a thin layer of aligned liquid crystals which is illuminated by polarized light and viewed through a polarized analyzer to give a real-time visual image in color of the acoustic wave pattern incident thereon. The acoustic wave pattern is typically an acoustic image of an insonified object such that the resulting device is useful in non-destructive testing for industry and medicine. The acoustic wave pattern can also be the human voice (helpful in teaching speech to the deaf) and music (for pleasurable and informative visualization of the musical sound). By use of a reference acoustic wave this device may be utilized to obtain a holographic image.

3,831,435

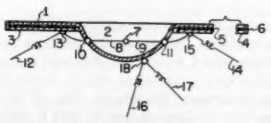
SILVER-FOIL PSYCHROMETER FOR MEASURING LEAF WATER POTENTIAL

Glenn J. Hoffman, Colton, and Stephen L. Rawlins, Riverside, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 6, 1973, Ser. No. 348,584

Int. Cl. G01n *25/62*

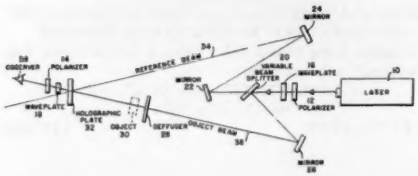
U.S. Cl. 73—77 **2 Claims**



An miniature apparatus for measuring the water potential of leaves in situ without temperature control. The apparatus in-

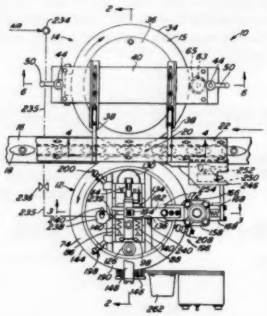
cludes a metal disk with a central cavity, a pair of thermally conductive washers mounted on the bottom of the disk, a reference thermocouple connected to each washer, and a measuring thermocouple located in the cavity. The thermocouples are connected in series.

3,831,436
MULTI-PURPOSE REAL-TIME HOLOGRAPHIC POLARISCOPE
Robert J. Sanford, 101 Julian Ct., Greenbelt, Md. 20770
Filed Feb. 23, 1973, Ser. No. 335,389
Int. Cl. G01b *11/16*
U.S. Cl. 73—88 A **7 Claims**



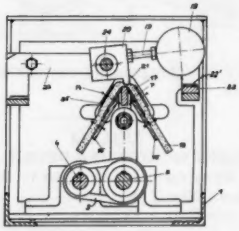
A modification of a real-time holographic interferometer to permit the observation of a complete set of interference patterns from a single reference hologram. The apparatus consists of a conventional off-axis transmission holographic set-up with the addition of several polarization optical elements to alter the polarization of the light at various stages of a procedure to study an object. These elements are adjusted so as to produce circularly polarized light for recording the reference hologram. After producing the hologram these elements are readjusted to any desired state of polarization and the corresponding interference pattern is observed in real-time and may be changed at any time to view a different type of interference pattern.

3,831,437
APPARATUS FOR SQUEEZE TESTING CONTAINERS
Richard S. Sheets, Elmira, N.Y., assignor to Powers Manufacturing Inc., Elmira, N.Y.
Filed Jan. 11, 1973, Ser. No. 322,663
Int. Cl. G01n *3/08*
U.S. Cl. 73—94 **16 Claims**



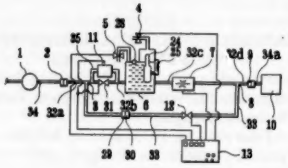
An apparatus for squeeze testing glass containers on a production line basis. The apparatus includes a squeeze wheel and a reaction wheel which are disposed in spaced side-by-side relation above a conveyor which moves the containers into a test zone between the wheels. One of the wheels is supported in part by resilient means so that it yields as the containers pass through the test zone while a squeezing pressure of predetermined magnitude is applied. Both round and non-round containers can be tested.

3,831,438
APPARATUS FOR TESTING THE BENDING STRENGTH OF ELASTIC MATERIALS
Karin Schmidt, Chicago 5, 2421 Kittsee, Austria
Filed Aug. 18, 1972, Ser. No. 281,961
Claims priority, application Austria, Aug. 26, 1971, 7461/71
Int. Cl. G01n *3/32*
U.S. Cl. 73—100 **8 Claims**



Two parallel carrying plates serve to grip workpieces of elastic material and are mounted in crossing guide slots for relative swinging in opposite directions. A bar is provided between the two carrying plates and adapted to be lifted and lowered thereby to support the elastic working at locations to be subjected to bending stress. As the base rises, each workpiece is subjected to increasing pressure by a weighted member bearing upon it at the bend.

3,831,439
FUEL CONSUMPTION METER
Toshiaki Konomi, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan
Filed June 29, 1973, Ser. No. 374,995
Claims priority, application Japan, June 30, 1972, 47-77901
Int. Cl. G01m *17/00*
U.S. Cl. 73—113 **10 Claims**



A fuel consumption meter for a motor vehicle comprises a bubble separating vessel and a fuel flow meter connected in series in the main pipeline between the fuel pump and a fuel supply member of the vehicle. The bubble separating vessel has an air vent valve, a float for measuring specific gravity and a thermometer. An auxiliary pipeline connected in parallel with the portion of the main containing the bubble separating vessel and the fuel flow meter provides a circulating circuit in which an electric pump is provided so as to recirculate the fuel through the bubble separating vessel and fuel flow meter in order to remove any air from the system. An electric circuit comprises controls for electromagnetic valves and for the circulating pump and amplifying, indicating and timing circuits for the fuel flow meter.

3,831,440

APPARATUS FOR MONITORING CARBURETORS OR OTHER GASOLINE-CONSUMPTION DEVICES

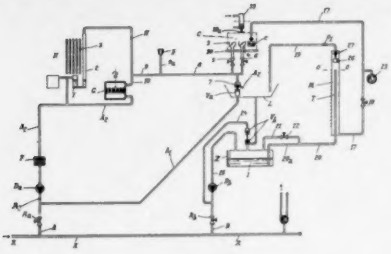
Francois Monnet, 1 Rue Grounod, 06 Nice, France

Filed Nov. 21, 1972, Ser. No. 308,406

Claims priority, application France, Nov. 21, 1971, 71.42994

Int. Cl. G01m 17/00

U.S. Cl. 73—113 9 Claims



Apparatus for monitoring the regulating carburetors or other gasoline-consumption devices comprises a graduated test tube adapted to be subjected at its upper part to a predetermined pressure by its connection with the float chamber of the carburetor or the like. A gasoline inlet tube opens at its upper end into the test tube, for discharging its gasoline therein. A tank for containing gasoline is provided, and there is a direct first connection between the lower end of the gasoline inlet tube and the base of the tank, and a second connection between the lower end of the gasoline inlet tube and the upper part of the tank. There are a number of valves including a valve within the second connection so as to enable, by a simple manipulation of the valves, a quantity of gasoline to be obtained in the test tube at a strictly metered and constant pressure.

3,831,441

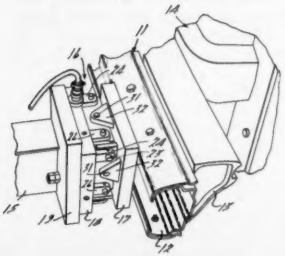
LOAD CELL

Johnny M. Petty, Warren, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 2, 1973, Ser. No. 337,515

Int. Cl. G01l 5/00

U.S. Cl. 73—141 A 12 Claims



A load cell insensitive to bending loads and able to accurately indicate off-center loading for tension or compression loads under static or dynamic conditions. The load cell comprises a plurality of strain gaged beams, the beams being selected to have substantially identical stress versus strain curves. The beams are supported in a simple arrangement and are effective to indicate desired load and to cancel out the effects of undesirable loads.

3,831,442

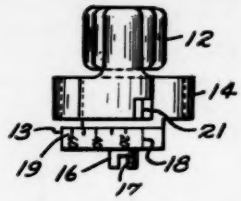
STRING TENSION MEASURING DEVICE

Millard M. Cummins; Richard H. Keates; Robert G. Best, and Donald L. Barr, all of Columbus, Ohio, assignors to The Thurman Manufacturing Company, Columbus, Ohio

Filed Jan. 3, 1973, Ser. No. 320,769

Int. Cl. G01l 5/06

U.S. Cl. 73—144 8 Claims



A device for measuring the tension of relatively taut strings of tennis rackets or the like. The device comprises a single piece of material formed to have a handle, a string engaging portion, and a resilient portion joining the two. The string engaging portion bears a calibrated scale and a reference mark. The handle includes an index mark positioned such that when the handle is twisted relative to the engaging portion as the latter is secured to a string, measurement of tension is indicated on the scale by the index mark when the reference mark is in alignment with the string being tested.

3,831,443

APPARATUS FOR INTERCOUPLING WELL TOOL SECTIONS HAVING ELECTRICAL AND FLUID LINES

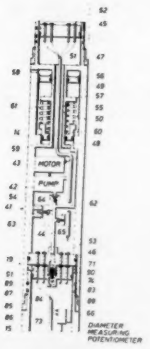
Jean Planche, L'Hay-Les-Roses, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jan. 19, 1973, Ser. No. 324,936

Claims priority, application France, Jan. 26, 1972, 72.02579

Int. Cl. E21b 47/00

U.S. Cl. 73—152 12 Claims

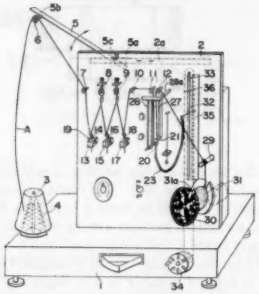


In the preferred embodiment of the invention disclosed herein, a well tool comprised of one or more separable bodies carrying electrical and hydraulic devices as required for operating the tool. To control the hydraulic devices, another separable body is provided with a selectively-operable hydraulic pressure generator. The mating ends of the several bodies are tandemly intercoupled by new and improved coupling means cooperatively arranged for facilitating the quick and foolproof connection and disconnection of electrical and hydraulic lines in each body.

3,831,444
YARN QUALITY ASSESSMENT METHOD AND APPARATUS THEREFOR

Toshiro Sasaki, Osaka, and Katsuaki Kuroda, Kyoto, both of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha (a/k/a Kurabo Industries Ltd.), Kurashiki-shi, Okayama-ken, Japan

Filed Jan. 26, 1973, Ser. No. 326,695
Claims priority, application Japan, Jan. 26, 1972, 47-10153; June 16, 1972, 47-60660
Int. Cl. G01l 5/06
U.S. Cl. 73—160 9 Claims

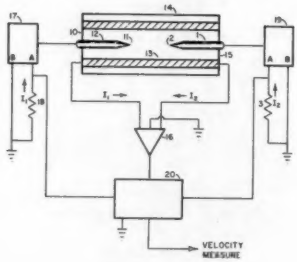


A method and apparatus for assessing knitting quality of yarn which comprises a plurality of elements which operatively cooperate so that some prediction can be made about the knitting quality of the yarn by the detection of the accumulated value of the resistances to various forces as a yarn winding tension, and by the comparison of the data with the respective standard value, an evaluation of the yarn can be made easily and simply before the yarn is knitted.

3,831,445
FLUID VELOCITY METER

Enoch J. Durbin, 246 Western Way, Princeton, N.J. 08540

Filed May 8, 1972, Ser. No. 250,964
Int. Cl. G01f 1/00
U.S. Cl. 73—194 F 13 Claims

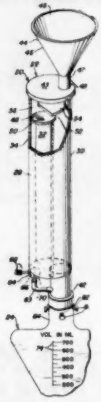


This disclosure is related to apparatus described in an earlier patent for mass flow meter apparatus awarded to the present inventor wherein the mass flow of flowing fluids was measured by directly measuring the drift of ionized portions of said fluid. The invention disclosed herein relates in particular to an improvement on said previous Patent in which apparatus is provided to eliminate calibration changes of the previous invention due to changes in mobility of ions of the fluid thereby converting the previous invention into a fluid velocity meter from a mass flow meter.

3,831,446
APPARATUS FOR MEASURING AVERAGE FLOW RATE

John F. Dye, Barrington, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed May 14, 1973, Ser. No. 360,213
Int. Cl. G01f 1/00
U.S. Cl. 73—194 R 21 Claims

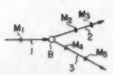


A device for measuring a duration of a liquid discharge having a hollow receptacle. The receptacle has an inlet port adjacent its upper end to receive the liquid discharge, and a cup-shaped pan below the inlet port to receive the liquid passing through the inlet port. The pan has a bore extending through the pan at a lower portion thereof and has an upper edge to direct overflow from the pan into a lower part of the receptacle. The receptacle also has a chamber below the pan communicating with the pan bore to collect liquid from the pan passing through the bore and to measure the period of time of the liquid discharge as indicated by the height of liquid collected in the chamber. Means is provided to also determine the total volume of the liquid discharge, and the average flow rate of the discharge may be determined from the measured volume and the time period of the discharge.

3,831,447
METHOD OF MEASURING THE FLOW RATE IN A PLURAL-FLOW SYSTEM

Shunsuke Nogita, and Yukio Kawamoto, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 20, 1973, Ser. No. 334,096
Claims priority, application Japan, Feb. 21, 1972, 47-17214
Int. Cl. G01f 1/00
U.S. Cl. 73—195 11 Claims



A plurality of measuring instruments are inserted in a flow system having a plurality of stable and continuous flow paths in such a manner as to constitute a plurality of material balance equation groups each including a multiplicity of measurement factors. In this way, whether the measurement of the flow rate in a flow path under consideration is accurate or not is determined statistically as it is related to the measurements of the flow rates in the remaining flow paths in respect of the material balance equation. Further, an estimated value which takes the place of an erroneous measurement is easily calculated.

3,831,448

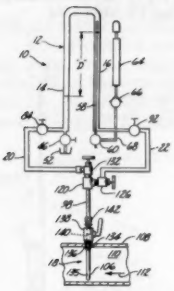
MANOMETER AND PITOT TUBE PROBE

Vernon E. Kors, 28660 Millbrook, Farmington, and Lawrence Leadbitter, 30698 Harlincin, Franklin, both of Mich. 48076

Continuation-in-part of Ser. No. 180,744, Sept. 15, 1971, abandoned. This application Feb. 15, 1973, Ser. No. 332,706

Int. Cl. G01f 1/00

U.S. Cl. 73—212 8 Claims



A manometer for measuring the velocity pressure of a fluid at selected positions along the length and cross section of a conduit or system of conduits carrying the fluid. The manometer comprises an inverted differential U-tube having a pair of downwardly extending legs, each leg of which is in fluid communication through control valves to a pitot tube probe selectively positioned within the conduit. The probe comprises an outer tubular member having a coaxially aligned inner tubular member carried by a plug enclosing the lower end of the outer tubular member. The lower end of the tubular member has a pair of diametrically opposed openings which respectively communicate via the probe plug with the annular space formed between the inner and outer tubular members and the interior of the inner tubular member. Valve means at selected locations along the length of the conduit permit the withdrawl and insertion of the pitot tube probe into the conduit without any fluid leaking therefrom.

One of the probe openings faces upstream to sense the total pressure of the fluid flowing through the conduit and communicates fluid at total pressure to one leg of the manometer while the other probe opening faces downstream to sense the static pressure of the fluid flowing through the conduit and communicates fluid at static pressure to the other leg of the manometer, wherein the difference in the height of the fluid in each leg of the manometer is indicative of the velocity pressure of the fluid within the conduit.

One leg of the manometer has an air supply tube with its upper end communicating with the upper interior of the U-tube while the lower end of the air supply tube is connected to a manually operated air supply pump. By pressurizing the air trapped with the inverted manometer with the air supply pump, any length of air column within the range of the manometer can be obtained to accommodate fluids at high pressure differentials without the possibility of the fluid in the high pressure leg spilling over the top of the U-tube and being exhuasted out the low pressure leg. A method of manufacturing the manometer probe is disclosed.

3,831,449

DEPTH GAUGE

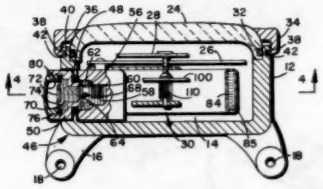
Douglas K. MacNiel, 1962 Balearic Dr., Costa Mesa, Calif. 92626, and Sohiel Azizi, 17171 Bolso Chica, Huntington Beach, Calif. 92647

Filed Dec. 8, 1971, Ser. No. 205,933

Int. Cl. G01f 23/14

U.S. Cl. 73—300 5 Claims

An improved depth gauge for use by a diver having a bourdon tube assembly with appropriate linkages to operate a dial for indicating the ambient depths as a function of pressure. The bourdon tube is filled with oil and is exposed to pressure through an open end secured in a fitting having a passage with a diaphragm seated therein exposed to the ambient pressure. The exposure of the diaphragm operatively pressurizes the oil in the bourdon tube to cause it to expand and operate the linkages for turning the dial.



A second embodiment of this invention incorporates a capillary tube depth gauge in combination with a bourdon tube or other mechanically reacting depth gauge. The capillary tube surrounds the dial face of the gauge and has appropriately scribed markings to show the depth corresponding to the extent of entrance of water into the capillary tube which is a function of pressure. In this manner, the optimum accuracy of both types of gauges can be utilized.

3,831,450

AGRICULTURAL ALARM SYSTEM TO WARN OF IMPENDING AGRICULTURAL PEST ATTACKS

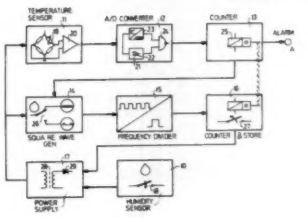
Winfried Schipke, and Friedrich Scharf, both of Stuttgart, Germany, assignors to Robert Bosch GmbH, Gerlingen-Schillerhoke, Germany

Filed Feb. 28, 1973, Ser. No. 336,824

Claims priority, application Germany, Apr. 17, 1972, 2218452

Int. Cl. G01w 1/06

U.S. Cl. 73—336 26 Claims

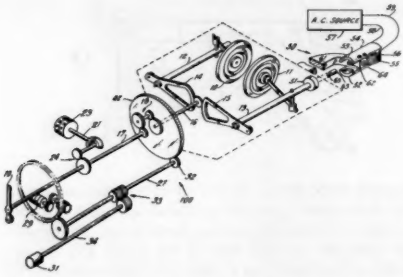


To warn farmers when conditions are favorable for fungus infection, that is, certain humidity and temperature conditions which have presisted for predetermined periods of time, a humidity sensing device senses humidity of the atmosphere in the region of the agricultural planting to provide a humidity sensing signal; a temperature sensing means senses temperature of the atmosphere and provides a temperature sensing signal; the signals are converted into digital form, or integrated over time, and a threshold circuit is provided which, when a certain time-integral of humidity or temperature, during predetermined conditions of other sensed condition (temperature or humidity) is determined, an alarm signal is given. If the signal is a digital signal, a counter is activated to count the digits above a threshold level of humidity, and giving an alarm signal when a certain time during which both temperature and humidity were at levels at which pests proliferate, is exceeded.

3,831,451
MEANS FOR AVOIDING STATIC FRICTION

Michael Argentieri, West Orange, and John H. Andresen, Jr., Hewitt, both of N.J., assignors to Intercontinental Dynamics Corporation, Englewood, N.J.

Filed Jan. 26, 1973, Ser. No. 326,999
Int. Cl. G01i 7/14
U.S. Cl. 73—387 6 Claims

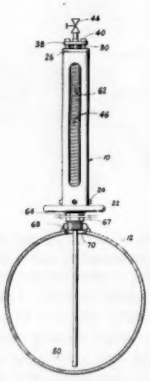


A pressure driven altimeter is provided with an A.C. torquer to impart low amplitude torsional oscillations to a drive shaft of the gear train between the aneroid mechanism and the output pointer. These shaft oscillations are coaxial with the direction in which this shaft is pivoted by a pressure-altitude sensing aneroid mechanism. These torsional vibrations serve to prevent buildup of static friction forces and overcome other friction forces that will interfere with altimeter accuracy and resolution.

3,831,452
GAS SAMPLER

Harold M. Pittenger, Tulsa, Okla., assignor to Charles Wheatley, Inc., Tulsa, Okla.

Filed Jan. 8, 1973, Ser. No. 321,661
Int. Cl. G01n 1/16
U.S. Cl. 73—421.5 R 5 Claims

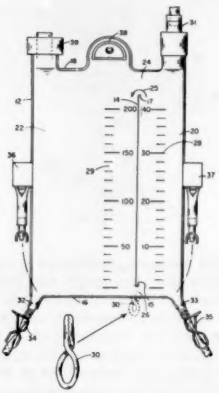


An apparatus for retrieving a sample of gas in a pipe line, or the like, which may be secured to the outer periphery of the pipe line for retrieving a sample of the fluid passing through the pipe line at substantially any desired area therein. An outer tube is threadedly engaged with a threaded shank secured to the outer periphery of the pipe line and carries an inner tube which is selectively inserted into the interior of the pipe line for picking up fluid samples therefrom. The position of the open portion of the inner tube within the pipe line may be adjusted for retrieving a fluid sample from substantially any desired cross sectional area within the pipe line.

3,831,453
URINE METER AND COLLECTION RECEPTACLE

Daniel M. McWhorter, Arlington Heights, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 10, 1972, Ser. No. 225,051
Int. Cl. A61f 5/44
U.S. Cl. 73—427 3 Claims

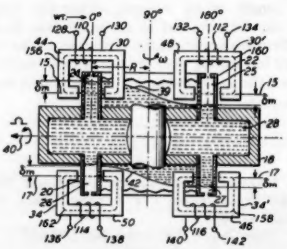


A combination urine meter and collection receptacle for measurement of liquid urine volume formed from a pair of plastic sheet panels, preferably flexible at least in part, closed along their peripheries, and having dividing wall means therein defining a lower volume first compartment and a higher volume second compartment. An inlet is provided into the first compartment, wherein liquid urine introduced thereinto may be measured by suitable indicia and thereafter transferred to the higher volume second compartment for collection. Overflow protection is also provided for the lower volume first compartment.

3,831,454
FLUID ROTOR MOTION SENSOR

Jay Hoffman, Livingston, N.J., assignor to The Singer Company, New York, N.Y.

Filed Mar. 25, 1971, Ser. No. 127,906
Int. Cl. G01p 9/00
U.S. Cl. 73—504 10 Claims



A multipurpose sensing device is disclosed having the sensing capabilities of both a two axis rate gyro and a single

axis accelerometer wherein these capabilities are achieved by measuring the displacement of a rotating body of fluid which results when the device disclosed is subjected to angular velocity rates or rectilinear accelerations.

3,831,455

CHAIN-TYPE JACK FOR HANDLING TENSILE AND COMPRESSIVE LOADS

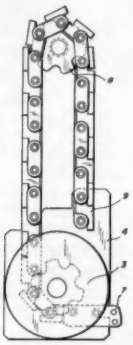
Theo Patrignani, Paris, France, assignor to Manufacture de Machines du Haut Rhin, Mulhouse-Bourtzwiller, France

Filed Apr. 24, 1972, Ser. No. 246,621

Claims priority, application France, Apr. 26, 1971, 71.14792

Int. Cl. F16h *29/02*

U.S. Cl. 74—89.21 **8 Claims**



An improved jack includes a fixed housing through which an elongated drive chain extends. A sprocket within the housing advances and retracts the chain through the housing via forward and rearward exit ports to provide a desired change in the direction of motion of the chain. The portion of the chain extending from the rearward port of the housing is further rotated back on itself through engagement with a floating guide member. The rear end of the chain is suitably anchored. The combination of the guiding member and the anchoring means serves to restrict the overall rearward extension of the guide member to a prescribed fraction of the forward extension and permits the form factor of the jack in its retracted position to be smaller than that in its extended position. The adjacent links of the chain include interlocking, axially aligned projections for withstanding compressive as well as tensile loads.

3,831,456

LINEAR ACTUATOR WITH LOCK

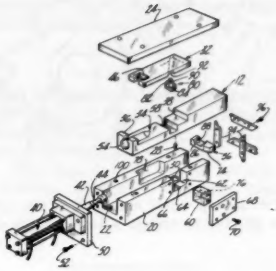
William R. Jahnke, Cincinnati, Ohio, assignor to KMS Industries, Inc., Ann Arbor, Mich.

Filed Apr. 13, 1973, Ser. No. 350,773

Int. Cl. F16h *21/44*

U.S. Cl. 74—110 **18 Claims**

A linear actuator with a reciprocable ram having a transversely movable wedge slidably received thereon for locking the ram in a range of extended positions. Both the ram and wedge are driven through a floating element received in the wedge



for rotation on an axis generally perpendicular to the axis of both the ram and wedge to eliminate backlash of the ram when locked in the extended position.

3,831,457

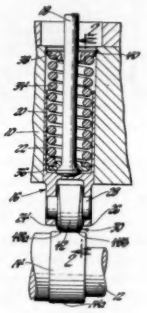
VARIABLE TRACKING CAM FOLLOWER

Richard A. Kern, Centerline, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 5, 1973, Ser. No. 338,369

Int. Cl. F16h *21/14*

U.S. Cl. 74—569 **6 Claims**



A cam follower in the form of a roller has an outer peripheral contact surface of varying width to effect variable roller edge contact on the surface of a cam with which it is in rolling engagement.

3,831,458

INTERMITTENT FEED MECHANISM

Akihiro Takanashi, Hachioji, and Seiya Hashimoto, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

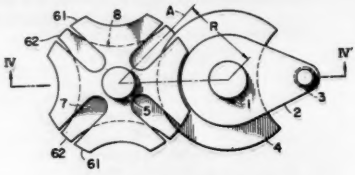
Filed Jan. 8, 1973, Ser. No. 321,964

Int. Cl. F16h *55/04*

U.S. Cl. 74—436 **10 Claims**

A mechanism for obtaining intermittent feed motion through a driven wheel in engagement with a driving wheel, said driven wheel being formed by a slotted rotating plate and

a rotating plate formed with arcuate cam-contacting recesses in such manner that each of the slots is adapted to engage a

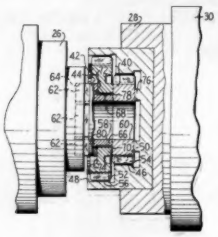


roller of the driving wheel and each of the cam-contacting recesses is adapted to engage a locking cam of the driving wheel.

3,831,459
CLUSTER GEAR ASSEMBLY PRODUCED BY FRICTION WELDING

Ronald L. Satzler, Metamori, and Marion R. Calton, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 148,780, June 1, 1971, Pat. No. 3,750,263. This application Mar. 26, 1973, Ser. No. 344,979
Int. Cl. F16h *55/12*
U.S. Cl. 74—439 **5 Claims**

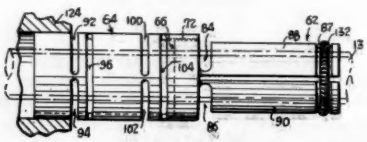


Cluster gear assemblies are produced by a method and apparatus which join a plurality of premachined gears by a common joining member. The plurality of gears are held in relative nonrotative relationship by special holding means which further establish precise angular and axial alignment between the gears and axial alignment between the joining member and the gears. Joining of the various members to produce the assembly is accomplished by friction welding.

3,831,460
ANTI-BACKLASH NUT

Francis M. Linley, Jr., Banks Rd., Easton, Conn. 06612

Filed Aug. 20, 1973, Ser. No. 390,069
Int. Cl. F16h *55/22, 55/18, 1/18*
U.S. Cl. 74—459 **18 Claims**

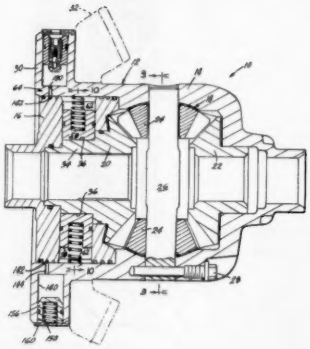


An anti-backlash nut construction for engagement with threads of a screw, the nut comprising a base portion and a threaded portion connected therewith. Both portions have central bores in alignment with one another to receive the screw. The threaded portion is elongate and slotted, comprising two elements which are capable of limited movement toward and away from one another. The nut threads are disposed on the internal surfaces of these elements. An O-ring or equivalent carried in a grooved formation on the outside surfaces of the elements biases the latter toward each other such that the internal threads thereon are brought into close engagement with the screw threads, thus eliminating all looseness and minimizing substantially all of the clearance space between the nut and screw threads which would otherwise give rise to undesirable backlash. An alignment sleeve for the nut is also provided to accommodate slight misalignment between the axes of the screw and the nut.

3,831,461
DIFFERENTIAL TRANSMISSION

Otto Mueller, 13 Byfield Ln., Dearborn, Mich. 48120

Filed Nov. 3, 1972, Ser. No. 303,629
Int. Cl. F16h *1/44*
U.S. Cl. 74—711 **8 Claims**



A differential transmission for automobiles which has a hydraulic mechanism in the differential carrier for limiting the differential action that can occur between the two driven axle shafts. A closed hydraulic circuit is provided which has compensation means to accommodate volumetric changes of the hydraulic fluid resulting from temperature changes, and the circuit is located in the differential carrier so as to provide optimum use of space provided therein.

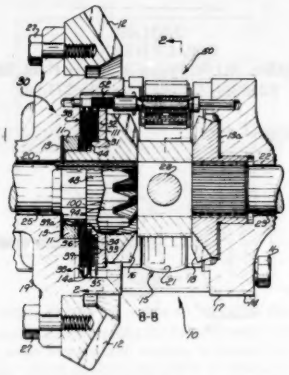
3,831,462
LIMITED SLIP DIFFERENTIAL

Jerry F. Baremor, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 235,280, March 16, 1972. This application Jan. 14, 1974, Ser. No. 433,064
Int. Cl. F16h *1/44*
U.S. Cl. 74—711 **11 Claims**

A limited slip differential mechanism includes a normally disengaged regenerative self energizing clutch assembly for producing lock-up when activated. Engagement of the clutch assembly is initiated by means of an actuator device which is in turn activated by a predetermined level of differential action between driving and driven members in the differential mechanism. The clutch assembly includes a first group of clutch friction elements which are connected for rotation with the driving member and another group of clutch friction elements connected for rotation with the driven members. Upon operation of the actuator, movement of a cam element is re-

tarded relative to one of the driven members. The cam element presses the groups of clutch friction elements together to thereby provide a force which further retards relative rotation between the members. To provide a clutch which has smooth locking characteristics due to the gradual application of locking torque, the complemental friction surfaces have a dynamic coefficient of friction which constantly increases to a



magnitude of at least 0.09 as the clutch is operated from a disengaged condition to a fully engaged condition. After initial actuation, the regenerative portion of the clutch assembly automatically increases the force pressing the complemental friction surfaces of the clutch friction elements together as a result of the previous retarding force until the driving and driven members are locked together.

3,831,463

HYDROMECHANICAL TRANSMISSIONS INCLUDING TORQUE CONVERTER HAVING RELEASABLE PUMP OR TURBINE COMBINED WITH HOLDING CLUTCH GEARS

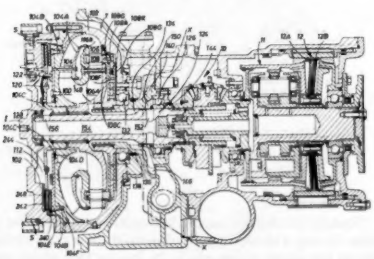
Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Vallingby, Sweden

Filed Feb. 1, 1973, Ser. No. 328,525

Claims priority, application Great Britain, Feb. 7, 1972, 5487/72

Int. Cl. F16h *47/00*

U.S. Cl. 74—732 **31 Claims**



This invention relates to a vehicle transmission, including a torque converter, which is capable of producing gentle shifts between different gear ratios. This is attained by releasing one of the bladed components in the torque converter during a gear shift.

In more detail, a torque converter is of the rotating casing type and the transmission includes a two speed gear having a holding clutch which may take either of two positions, viz. high and low, and the releasable bladed component is automatically released from the rotating casing when a holding clutch is changed from one position to another. The releasable bladed component may be the pump component or the turbine component of the torque converter.

3,831,464

PLANETARY GEAR CHANGE-SPEED TRANSMISSIONS, ESPECIALLY FOR MOTOR VEHICLES

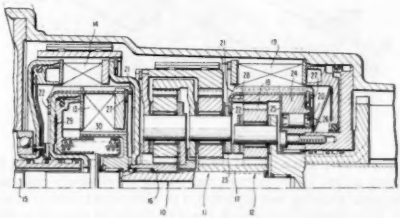
Wolfgang Zaiser, Althutte, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Sept. 8, 1972, Ser. No. 287,216

Claims priority, application Germany, Sept. 9, 1971, 2145105

Int. Cl. F16h *51/10*

U.S. Cl. 74—763 **26 Claims**



A planetary gear change-speed transmission for vehicles, especially an automatically shifting change-speed transmission for motor vehicles in which two concentrically arranged lamellae friction clutches are provided at the input, and an output planetary gear set is shifted by means of a free-wheeling device and a lamellae friction device acting as a brake on the ring gear at the output of the transmission; the ring gear of the planetary gear set coordinated to the output and the outer race of the free-wheeling device are inserted into an undulatory sheet metal sleeve which simultaneously forms the inner disk carrier for the brake.

3,831,465

CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

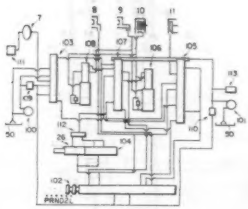
Noboru Murakami, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Oct. 2, 1972, Ser. No. 294,106

Claims priority, application Japan, Oct. 2, 1971, 46-77243

Int. Cl. B60k *23/02*

U.S. Cl. 74—869 **10 Claims**



In an automotive power transmission having at least two friction engaging devices to establish different forward speed ratio power trains therethrough, a hydraulic control system therefor is provided with a cooperating pair of modulator

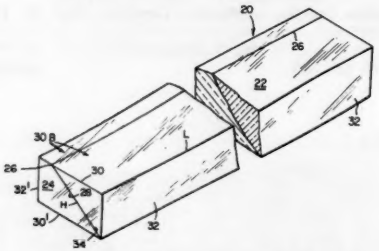
valves. Fluid pressures selectively fed to and from the friction engaging devices under the control of various shift valve devices are modulated by the modulator valves to minimize the jerks that may be produced during the transition.

3,831,466

GLASS BLADE AND GLASS BLADE BLANK

John Wilbur Hicks, Jr., Apple Hill Rd., Sturbridge, Mass. 01566

Filed Feb. 8, 1972, Ser. No. 224,533
Int. Cl. B21k *11/00*; **B26b** *19/54*
U.S. Cl. 76—104 R **8 Claims**



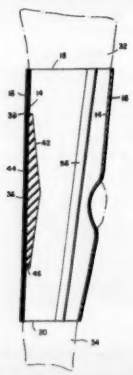
A blank of a plurality of vitreous materials is prepared by selecting a first vitreous material which is relatively resistant to chemical etching and grinding it to a desired blade configuration with dimensions which are a multiple of the dimension of the desired end product as represented by a predetermined attenuation ratio, then a second vitreous material which is susceptible to chemical etching is selected and prepared to have a portion complementary to said blade portion of said first material, and the blank comprising both matrials positioned in complementary contacting relationship is heated to about their softening points and drawn down with a desired attenuation to produce a continuous blade ribbon in said first vitreous material of uniform predetermined cross-sectional dimensions. The second material is then etched away from the ribbon comprising the first material and cut into desired blade lengths.

3,831,467

KNEE BRACE

Robert R. Moore, 5401 San Leandro St., Oakland, Calif. 94601

Filed Mar. 16, 1973, Ser. No. 342,163
Int. Cl. A61f *3/00*
U.S. Cl. 128—80 C **10 Claims**



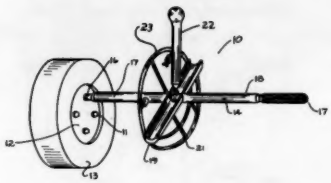
An orthopedic appliance for bracing the human knee and restraining the same against normal knee bending movement or genuflection, or other knee movement, such as lateral movement. The appliance wraps around the leg and is provided with an opening through which the patella may extend, and opposite such opening is a resilient pad of tapered form engageable with the popliteal area of the knee. Rearwardly of the pad are rigid longitudinally extending bracing elements, and additional parallel elements are provided adjacent the patella opening to prevent lateral movement.

3,831,468

IMPACT WRENCH

Robert G. Miller, 311 W. Prairie St., Camp Point, Ill. 62320

Filed July 13, 1972, Ser. No. 271,505
Int. Cl. B25b *19/00*
U.S. Cl. 81—52.3 **1 Claim**



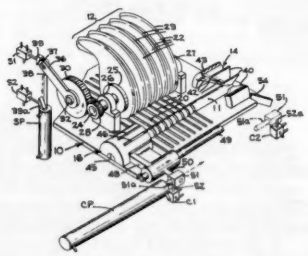
An impact wrench for use in tightening or loosening threaded parts, the wrench including a spindle adapted to engage a nut or bolt, a moment arm porjecting transversely of the spindle, a semicircular brace disposed radially of the spindle and interconnected at its ends to the ends of the moment arm, and a breaker bar pivotally secured on the spindle and adapted to impart a force substantially simultaneously to the moment arm at both ends thereof thus applying a uniform and balanced application of torque to the workpiece.

3,831,469

TABLE TOP PINEAPPLE SLICING AND CHUNKING

Leslie Vadas, Los Gatos, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 26, 1973, Ser. No. 336,153
Int. Cl. B26d *3/26, 7/06*
U.S. Cl. 83—39 **17 Claims**

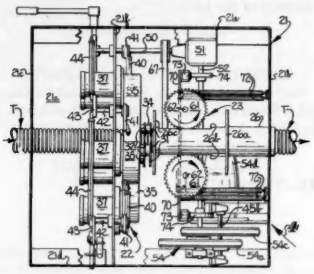


Contour peeled pineapple halves are supported on a slotted table having a slotted guide rib within their core cavities. The halves are sliced transversely by knives that move below the table, whereupon a chunking plunger pushes the transversely sliced halves through radial chunking knives. In one embodiment the slotted table is advanced and retracted to alternately receive halves from two infeed conveyors, and the chunking plunger is double ended to alternately feed sliced halves through one of two sets of opposed chunking knives. The slicing knives can be mounted below the table and operated by planetary gearing.

3,831,470
METHOD AND APPARATUS FOR FORMING SLITS IN TUBES

Ernest J. Maroschak, Box 878, Roseboro, N.C. 28382

Filed July 13, 1972, Ser. No. 271,379
Int. Cl. B23c *1/14*; B23d *25/16*; B26d *3/06*
U.S. Cl. 83—39 1 Clai..

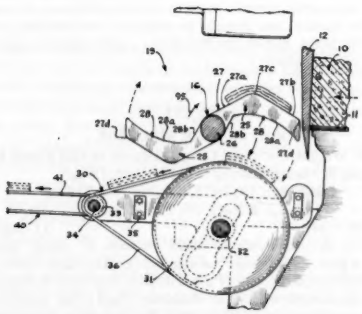


A tube is slit or slotted for use as an irrigation pipe, for example, by intermittently feeding the tube through a slitting station in a stepwise manner and moving a plurality of rotating cutting blades which encircle the path of travel of the tube into cutting engagement with the tube between successive stepwise movements thereof. The apparatus includes a pair of rotary feed members which engage portions of the tube closely adjacent sets of rotary cutting blades arranged around the path of travel of the tube, and means are provided for operating the rotary feed members to impart the stepwise movement to the tube in timed relation to inward and outward movements of the cutting blades.

3,831,471
GROUPING AND STACKING ATTACHMENT FOR SLICING MACHINE

Conn Rehlander, La Porte, Ind., assignor to Land O'Frost, Inc., Lansing, Ill.

Continuation of Ser. No. 171,183, Aug. 12, 1971. This application June 4, 1973, Ser. No. 366,404
Int. Cl. B26d *4/46*
U.S. Cl. 83—91 10 Claims

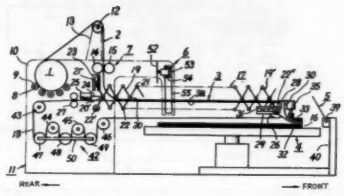


An attachment for a heavy duty food slicing machine capable of either grouping or stacking slices received by the slicing machine, wherein a flipper is provided onto which the meat slices are deposited directly upon being sliced, and from which the meat slices are transferred to a station for further processing. A hydraulic drive motor operates the flipper by periodically rotating the flipper through 180° revolutions. The flipper when stationary, receives slices, and when rotating, transfers the slices to a station for further processing. The hydraulic motor is uniquely constructed to perform the drive function necessary to periodically rotate the flipper through 180° revolutions.

3,831,472
METHOD OF AND APPARATUS FOR SPREADING CLOTH

Tadajiro Sasaki, Osaka, Japan, assignor to Kabushiki Gaisha Sesaki Seisakusho, Osaka, Japan

Filed May 31, 1973, Ser. No. 365,686
Claims priority, application Japan, June 12, 1972, 47-58792
Int. Cl. D06h *7/00*
U.S. Cl. 83—92 7 Claims

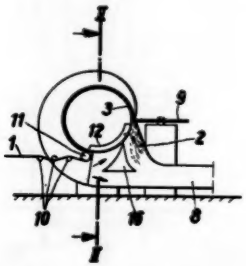


A cyclically operated cloth spreader wherein cloth is drawn from a supply roll mounted for rotation about its axis by a feeding device and a measured length of the cloth is laid upon the upper flight of a traveling belt of a conveyer which latter is mounted for movement in a back-and-forth manner. When the conveyer and the cloth thereon reach the forward limit position in its stroke, the leading end of the cloth is gripped and held. The conveyer now returns to its starting position, leaving the leading end of the cloth gripped whereupon a rotatable cutting blade then moves across and cuts the cloth leaving a length of the cloth on a pile of cloth lengths previously fed and cut by the spreader. This completes one cycle of operation which then repeats itself.

3,831,473
DEVICE FOR CUTTING ENDLESS MATERIAL, FOR EXAMPLE FOR THE PRODUCTION OF STAPLES FROM SYNTHETIC FIBERS

Hans Fleissner, Frankfurt am Main, Germany, assignor to Vepa AG, Riehen/Basel, Switzerland

Filed Apr. 24, 1972, Ser. No. 246,659
Claims priority, application Germany, Apr. 23, 1971, 2119821; Dec. 1, 1971, 2159485; Feb. 10, 1972, 2206255
Int. Cl. D01g *1/04*
U.S. Cl. 83—100 41 Claims



A device for cutting endless fibrous material, particularly for the production of staples from synthetic fibers, which com-

prises a rotatably disposed support means feeding the fibrous material to a cutting zone, said support means being operatively associated with a rotatably mounted cutting means and comprising drum means subjected to a suction draft.

3,831,474

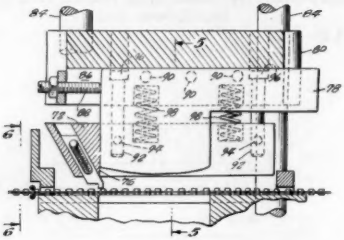
SLIDE FASTENER GAPPING MACHINE

Morris Perlman, Brooklyn, N.Y., assignor to Carbide Form Grinding Inc., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 837,483, June 30, 1969, abandoned. This application July 5, 1973, Ser. No. 376,928

Int. Cl. B26d *7/16, 7/02*

U.S. Cl. 83—143 **10 Claims**



A machine for punching out interlocked teeth carried on adjacent edges of a pair of tapes of a continuous slide fastener chain to provide in the latter gaps free of teeth. The machine comprises die means adapted to receive on an upper surface thereof a portion of the slide fastener chain to be gapped, punch means cooperating with the die means for punching out interlocked teeth for forming a gap free of teeth in the slide fastener chain, and means for automatically adjusting the position of the slide fastener chain in longitudinal direction relative to the punch means so that the teeth on opposite ends of the gap will be fully cut through without damage to each next adjacent tooth remaining on the slide fastener chain.

3,831,475

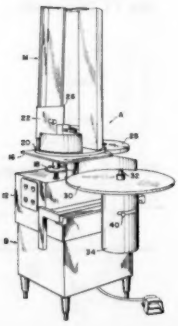
COMESTIBLE SLICING APPARATUS

Louis A. Bettcher, Amherst, Ohio, assignor to The Bettcher Industries, Inc., Birmingham, Ohio

Continuation-in-part of Ser. No. 215,462, Jan. 5, 1972, Pat. No. 3,782,230. This application Sept. 24, 1973, Ser. No. 400,344

Int. Cl. B26d *7/06; 7/12*

U.S. Cl. 83—161 **3 Claims**



Slicing apparatus having a magazine with upright product receptacles for carrying comestible workbodies in a circular path past a rotating knife in a table recess to sever slices from the bottom of workbodies, product followers slidable on receptacle guides to urge workbodies toward the knife, table height adjustment for controlling the thickness of slices being severed, a fluid-pressure actuated ram for lifting the product followers, a unitary plastic or like guard for the knife, and a power driven variable speed rotatable circular table below the knife for receiving the sliced products and conveying them from the vicinity of the knife.

3,831,476

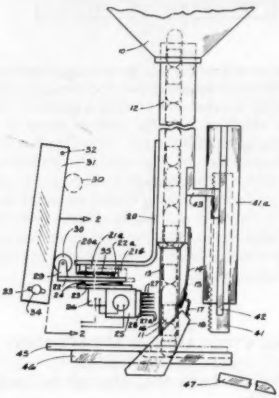
CAPSULE HANDLING APPARATUS

Oscar B. Noren, Grosse Pointe Farms; Carl C. Garland, and Edmund J. Kwarsick, both of Detroit, all of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Feb. 12, 1973, Ser. No. 331,778

Int. Cl. B26d *7/10;* **B26f** *1/24*

U.S. Cl. 83—170 **5 Claims**



Apparatus and means are provided for the handling of hard shell pharmaceutical capsules comprising means for supporting each capsule one at a time at a fixed work station, a set of probes spaced in a pattern generally parallel to the capsule length axis and arranged to reciprocate on a radius to and from the supported capsule so as to vent or perforate the side wall of the capsule and thereby produce a corresponding pattern of vent holes, and means for removing the vented capsule from the work position.

3,831,477

SCRAP CUTTER MACHINE

Beryle W. Wright, Portland, Oreg., assignor to Mill Power Engineering & Manufacturing Co., Portland, Oreg.

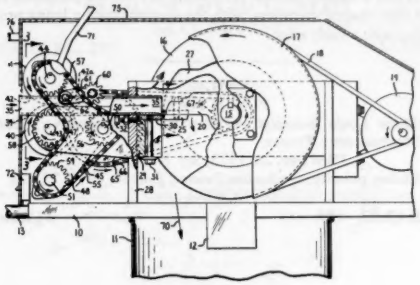
Filed Mar. 19, 1973, Ser. No. 342,715

Int. Cl. B26d *1/56;* **B23d** *25/02*

U.S. Cl. 83—349 **11 Claims**

A motor-driven flywheel shaft mounts a cutter blade between a pair of flywheels. An identical cutter blade forms an anvil at the discharge end of a horizontal feed tube extending between the two flywheels. A stationary feed roller protrudes through an opening in the bottom of the feed tube and a companion feed roller protrudes through an opening in the top of the feed tube to provide a pair of pinch rolls for feeding elongated pieces of material, such as steel strapping, wire or plastic, which is to be cut into short lengths for storage or disposal. The shafts of the two pinch rolls are equipped with sprocket wheels driven by a chain from a sprocket wheel on a feed drive shaft which is driven by the flywheel shaft. The

upper pinch roll is mounted on a rocker frame having pivotal movement on the feed drive shaft. Chain tension exerted in



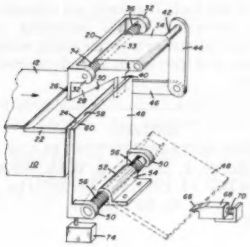
rotating the pinch rolls pulls the upper roll down toward the lower roll to grip and feed the material through the tube.

3,831,478

PRINT CUTTING MECHANISM FOR BORDERED AND BORDERLESS PRINTS

Luther M. Wright, Brockport, and William A. Epps, Rochester, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 30, 1973, Ser. No. 383,649
Int. Cl. B26d *5/02*
U.S. Cl. 83—368 **8 Claims**



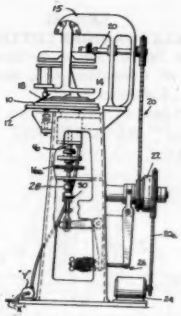
A print cutting mechanism for cutting prints from a web and operable in a first mode to cut individual bordered prints from a web containing bordered prints, and in the second mode to cut individual borderless prints from a web containing borderless prints. The cutting mechanism is provided with a stationary bed blade having a cutting edge, and a movable cutting knife having two cutting edges spaced apart a distance slightly greater than the distance between the leading and trailing ends of two adjacent borderless prints. In the first mode of operation, the cutting edge of the stationary bed blade cooperates with one of the two cutting edges of the knife to sever individual prints having a border. In the second mode of operation, a movable bed blade is moved to a borderless print cutting position in which a cutting edge thereof is spaced from the cutting edge of the stationary bed blade a distance slightly greater than the distance between the leading and trailing ends of two adjacent borderless prints on the web. Accordingly, when the movable cutting knife is moved between the stationary and movable bed blades, the cutting edges of the knife and blades cooperate to cut out the border portion between the two adjacent prints to provide an individual borderless print.

3,831,479

COUPLING DEVICE FOR A CUTTING MACHINE

Herbert R. Polleys, New Haven, Conn., assignor to Wellman Company, Medford, Mass.

Filed Nov. 23, 1971, Ser. No. 201,418
Int. Cl. A43d *7/08*
U.S. Cl. 83—380 **10 Claims**



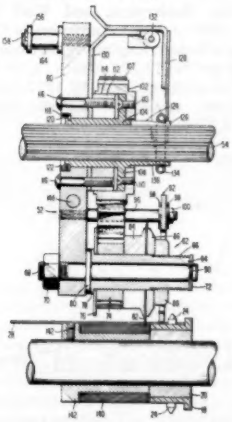
A coupling device for use in a cutting machine, the coupling device being interposed between and connectable to a clamp actuating assembly and a cutter drive unit. The coupling device includes a turnbuckle coupling member having an eyelet which may be hooked upon or, alternatively, unhooked from a hook presented by a second coupling member. The coupling device enables a machine operator to inactivate the cutter drive unit when adjustment of the clamp actuating assembly is to be effected.

3,831,480

ROTARY CUTTER-SLITTER FOR HIGH SPEED BURSTING APPARATUS

James Curt Phillips, 35 Coach St., Canandaigua, N.Y. 14424

Filed May 1, 1972, Ser. No. 249,341
Int. Cl. B23d *19/06*
U.S. Cl. 83—481 **4 Claims**



The invention relates to a demountably replaceable rotary cutter-slitter provided with a demountable, circular blade of the so-called throw-away, disposable type permitting a dull

olade to be quickly and easily replaced with a sharp blade. The cutter-slitter device can be positioned to accommodate varying widths items and the location of the cutter relative to the edges of the item may be adjusted according to the desired dimensions by the simple expedient of sliding the cutter normal to the path of movement of the item web avoiding unnececcary downtime of the associated apparatus, e.g., burster.

3,831,481

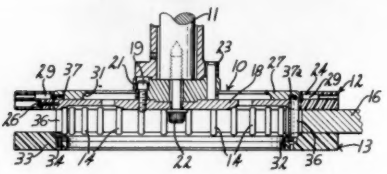
CUTTER REELS FOR FIBER CUTTING APPARATUS

Donald W. Van Doorn; James B. Hawkins, and Roy T. Williams, all of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Filed June 14, 1971, Ser. No. 152,758

Int. Cl. B26d *1/12*

U.S. Cl. 83—674 **13 Claims**



A cutter reel for tow cutting apparatus especially for use in apparatus as shown, described and claimed in U.S. Pat. No. 3,485,120. The construction provides reels which compared to prior art reels are more self cleaning, in which the blades may be more safely installed and removed, in which shorter and narrower blades may be used without decreasing the effective cutting lengths thereof or the strength of the same, and in which it is impossible to install the blades backwards. Further, the new reel causes the blades to be positioned correctly, in positive manner, when the reel parts are assembled and the construction decreases the damage to the reel parts and the blades by greatly decreasing the cahnce of the cutting edges of the blades contacting the reel parts when changing blades.

3,831,482

APPARATUS FOR CUTTING OF FIBER STRANDS

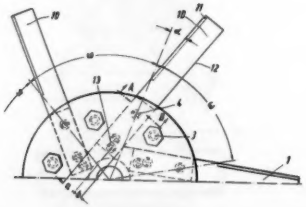
Norbert Eichler, Bohlerwerk, and Kurt Urban, Waidhofen/Ybbs, both of Austria, assignors to Gebr. Bohler & Co., Aktiengesellschaft, Kapfenberg/Steirmark, Austria

Division of Ser. No. 18,274, March 10, 1970, Pat. No. 3,735,661. This application Nov. 30, 1972, Ser. No. 310,799

Claims priority, application Austria, Mar. 10, 1969, 2329/69; July 9, 1969, 6564/69

Int. Cl. B26d *1/28*

U.S. Cl. 83—675 **2 Claims**



An apparatus for cutting fiber strands in which there is provided a rotatable clamping head defined by two disc-shaped members, means for forcing the members against each other and knives clamped between the disc members and protruding from the periphery thereof, each knife being constituted by a straight metal body of substantially triangular cross-section having a first portion clamped between the disc-shaped members and a second portion protruding beyond the periphery of the disc-shaped members, with the second portion being provided with a knife edge.

3,831,483

PUNCH TOOL

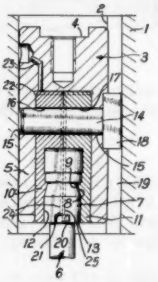
Philippe Louis Beauplat, 44 Rue de Montmorency, 95230 Montmorency, France

Filed Dec. 26, 1973, Ser. No. 428,012

Claims priority, application France, Jan. 14, 1973, 73.273

Int. Cl. B26d *1/00*

U.S. Cl. 83—698 **4 Claims**



A punch tool is mounted within a tubular portion of a tool-carrier by means of two separable half-shells which engage over the shank of the tool. The shells are retained within the tool-carrier by means of a pin extending transversely therethrough. The tool-carrier is reciprocable within a bore of a support member, and the pin has a head engaged in an axial groove in the bore.

3,831,484

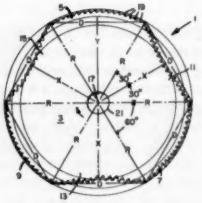
LOBED ROTARY CUTTING BLADE

David T. Gibb, Rt. No. 2, Ellensburg, Wash. 98926

Filed Dec. 13, 1971, Ser. No. 207,416

Int. Cl. B27b *33/08*

U.S. Cl. 83—847 **3 Claims**



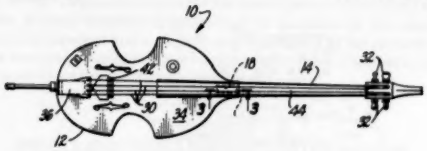
A multi-lobed cutting blade having a plane member adapted for mounting to a rotary drive shaft at right angles to the plane member. The plane member includes three or more lobes spaced apart relative to one another and a plurality of abbreviated sectors spaced apart relative to one another with an abbreviated sector intermediate two lobes such that the outer peripheral edge of each lobe extends to the outer peripheral edge of an abbreviated sector. Each of said lobes and abbreviated sectors carries a cutting edge surface about its' outer periphery.

3,831,485

STRINGED MUSICAL INSTRUMENT WITH REMOVABLE NECK

Edgar E. Dopera, 1404 Gaylord, Long Beach, Calif. 90813

Filed May 29, 1973, Ser. No. 365,023
Int. Cl. G10d 1/02
U.S. Cl. 84—275 3 Claims



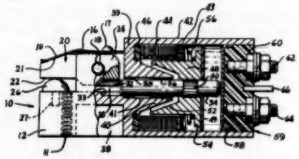
A stringed musical instrument such as a bass or bass viol can be constructed so that the neck and strings may be detached from the body of the instrument so as to facilitate movement or transportation of the instrument from one location to another. Preferably, the neck includes a male type plug which fits within a female type socket in the body of the instrument so as to hold the neck in place. Fastener means may be employed to secure the plug relative to the body of the instrument. The strings may be secured to the body of the neck by a hook type tailpiece so that they may be readily detached from the body of the instrument. A removable bridge which may contain a transducer is preferably used between the strings and the body of the instrument.

3,831,486

ELECTROMAGNETICALLY OPERATED LATCH

Betty Jane Yost, Dayton, Ohio, assignor to Ledex, Inc., Dayton, Ohio

Filed Dec. 11, 1972, Ser. No. 313,939
Int. Cl. A44b 11/25; F41f 5/06
U.S. Cl. 89—1.5 D 5 Claims



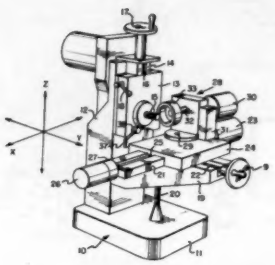
A latch device is assembled upon a one-piece body member having an electromagnet core portion at one end thereof and a platform extending from the core portion to the other end thereof. The one-piece body includes parallel stanchions rising above said platform to support a shaft pivotally mounting a lever which cooperates with a knob on said platform to provide a latch mechanism. The stanchions also support a plate spring biasing said lever against said knob to yieldingly close said latch mechanism. An electromagnet assembled about said core portion acts, when energized, to drive one end of a second shaft into a chamber between said lever and said platform to positively lock said latch mechanism.

3,831,487

METHOD FOR MILLING CAMS FOR SWISS-TYPE SCREW MACHINES

John A. Villano, 17 Brown St., Waterbury, Conn. 06702

Division of Ser. No. 104,662, Jan. 7, 1971, Pat. No. 3,714,865.
This application Dec. 14, 1972, Ser. No. 315,134
Int. Cl. B23e 1/18
U.S. Cl. 90—11 C 1 Claim



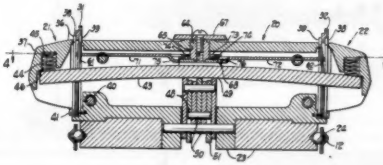
The invention is directed to a novel apparatus for milling Swiss-type screw machine cams. The invention provides a highly simplified and economical numerically controlled system enabling Swiss-type screw machine cams and similar articles to be milled with an ease and precision heretofore unattainable otherwise than with highly sophisticated and costly equipment. In its most typical application, the invention is utilized in the retro-fitting of an existing milling machine apparatus of otherwise conventional construction. Alternatively, the invention can be applied in the first instance, in connection with the manufacture of modified milling machines incorporating the new control system.

3,831,488

KEY VISE GAUGE

Robert H. Richens, Macedonia, and Charles A. Garner, Strongsville, both of Ohio, assignors to Cole National Corporation, Cleveland, Ohio

Filed Nov. 20, 1972, Ser. No. 308,275
Int. Cl. B23c 9/00; B25b 1/14, 1/20
U.S. Cl. 90—13.05 11 Claims

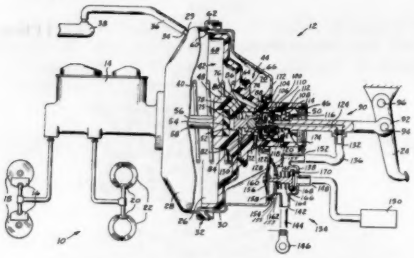


A key vise gauge is disclosed wherein a cam moves two cam follower links to move two bottom gauges in each of two key vises. The gauges move laterally within apertures in the key vise jaws and have three positions to accommodate three different styles of keys. Two of the positions are symmetrical about the cam axis and a third position of the gauges is assymetrical to accommodate a master key and a key blank in the same attitude in the two vises. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications and is not to be construed as a limitation on the scope of the claimed subject matter.

3,831,489
TUBULAR PUSH ROD MEANS FOR SERVOMOTOR

Ji Yah Woo, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Nov. 13, 1972, Ser. No. 306,256
Int. Cl. F01b 25/04; F15b 9/10
U.S. Cl. 91—32 10 Claims

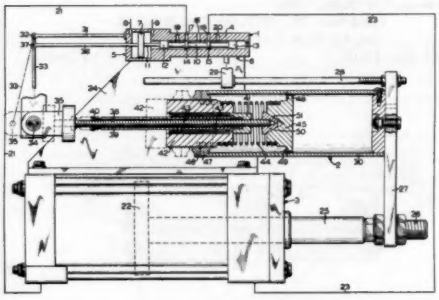


A control valve for a servomotor wherein vacuum, air at atmospheric pressure and air above atmospheric pressure are sequentially communicated to a rear chamber of the servomotor to create an operational pressure differential across a movable wall with vacuum in a front chamber to develop an input force to meet an operational output condition.

3,831,490
FLUID PRESSURE OPERABLE SERVO POSITIONER

Paul E. Olson, and Homer A. Knight, both of Lexington, Ky., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sept. 15, 1972, Ser. No. 289,754
Int. Cl. F15b 13/16
U.S. Cl. 91—387 4 Claims

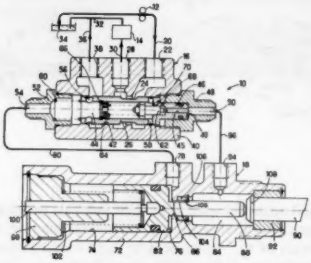


A servo positioner for selectively positioning a machine component or device in accordance with a preselected fluid pressure signal input. An operator controlled actuator, when subjected to a preselected control pressure signal, causes a valve portion to transmit operating fluid pressure to a power cylinder for positioning the machine part or device connected thereto at a position determined by the degree of the control pressure signal, and a force-balancing portion for counterbalancing the force exerted by the power cylinder for maintaining the preselected position thereof and for restoring the valve portion to a neutral position.

3,831,491
BRAKE BOOSTER

Alfred William Thomas, Bubingen, Germany, assignor to Deutsche Bendix Aurustungs GmbH, Saarbrucken, Germany

Filed May 4, 1972, Ser. No. 250,397
Claims priority, application Germany, May 25, 1971, 2125880
Int. Cl. F15b 9/10
U.S. Cl. 91—391 12 Claims

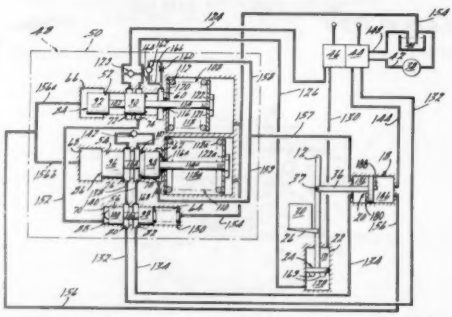


A hydraulic booster is disclosed which includes a piston which is actuated by fluid pressure communicated into the booster from an external source by a spool valve. An operator-actuated input rod generates fluid pressure in a control chamber when the booster is actuated. The pressure generated in the control chamber shifts the spool valve to a position admitting fluid pressure to the piston.

3,831,492
OVERLOAD PROTECTION DEVICE FOR COUNTERBALANCE VEHICLES

Michael R. Young, Farmington, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 4, 1972, Ser. No. 312,087
Int. Cl. F15b 11/16
U.S. Cl. 91—411 R 39 Claims



An overload protection device for a vehicle, such as a lift truck, having a primary load member or mast pivotally mounted on a frame and a secondary load member or forks movably mounted on the primary member and adapted to hold a load. The overload protection device includes a fluid actuated double acting piston-cylinder and a pressure actuated valve operable in response to a pressure signal representative of the difference in pressure on opposite sides of the piston to prevent movement of the load members in one direction when the overturning moment on the vehicle ex-

ceeds a safe value. A stop assembly is provided in the piston-cylinder to prevent the pressure of the fluid on either side of the piston from becoming zero when the piston approaches either end of the cylinder. The valve includes an override mechanism to allow pivotal movement of the primary member, irrespective of the presence of an overload signal, whenever the secondary member is in a given position relative to the primary member. Damping means are provided to prevent false actuation of the valve in the presence of rapidly changing pressure signals from the piston-cylinder. The valve is further designed to decrease the rate of pivotal movement of the primary member in proportion to increases in the overturning moment and to rapidly stop movement of the secondary member relative to the primary member when the overturning moment approaches an unsafe value.

3,831,493

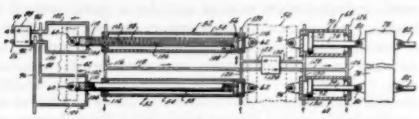
PROPULSION NOZZLE AND ACTUATOR SYSTEM EMPLOYED THEREIN

Robert Price Wanger, Fairfield, Ohio, assignor to General Electric Company, Lynn, Mass.

Division of Ser. No. 264,394, June 19, 1972. This application Sept. 13, 1973, Ser. No. 396,985

Int. Cl. F15b *11/00;* **F01b** *1/02*

U.S. Cl. 91—411 R **8 Claims**



A propulsion nozzle is described in combination with a gas turbine engine. The hot gas stream of the engine is discharged through the nozzle for forward propulsion, or may be discharged laterally thereof for reverse thrust. The nozzle is of the variable geometry, plug type wherein flaps are pivotal to vary the discharge and throat areas thereof for different flight conditions spanning subsonic and supersonic operation. The flaps for controlling discharge area are pivotally mounted on a frame which is longitudinally displacable to uncover ports in the sides of the pod or nozzle structure. The hot gas stream may then be laterally and forwardly discharged therethrough for reverse thrust. Axial movement of this frame is controlled by a set of first actuators. Pivotal movement of the flap is controlled by a set of second actuators. The first and second set of actuators are sequentially interconnected in such a fashion that both sets may be powered from a single source of pressurized hydraulic fluid through "hard" conduits. Valves are employed to enable independent operation of each set of actuators in providing the varying thrust capabilities of the nozzle.

3,831,494

HYDRAULIC SERVOMOTOR

Jean-Jacques Carre, Montreuil, France, assignor to Societe Anonyme D. B. A., Paris, France

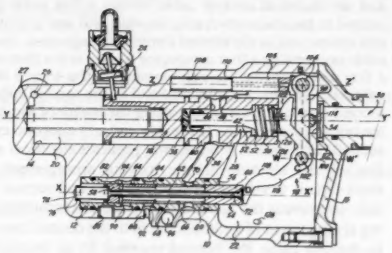
Filed May 17, 1973, Ser. No. 361,374

Claims priority, application France, June 12, 1972, 72.21052

Int. Cl. F15b *13/14*

U.S. Cl. 91—434 **9 Claims**

The servomotor comprises a boost piston whose movements depend on the pressure of fluid contained in an actuating chamber, said pressure being controlled by a distributing valve connected to a pressure fluid source and to a reservoir. The valve is operated by a push rod through the intermediary of a lever assembly responsive to the relative movement of the push rod and of the boost piston. The push rod, mounted coaxially to said boost piston, projects therein. The projecting



end contains a helical groove whose top cooperates slidably with the surface of a cylindrical bore formed in the boost piston.

3,831,495

REMOTELY CONTROLLED ELECTROHYDRAULIC SYSTEM WITH FAIL-SAFE FEATURES

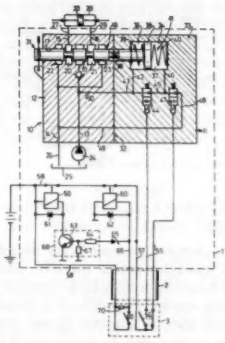
Winfried Arnold, Moglingen, and Johannes Locher, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 9, 1973, Ser. No. 387,201

Claims priority, application Germany, Aug. 18, 1972, 2240607

Int. Cl. F15b *13/044*

U.S. Cl. 91—459 **9 Claims**



The system includes a hydraulic user device and a source of hydraulic fluid. A hydraulic arrangement connects the source of fluid to the user device and provides a path for the flow of fluid from the source to the user device, and includes a control member positioned in such path and mounted for movement between a plurality of positions in different ones of which the control member differently affects the flow of fluid from the source to the user device, including a neutral position in which the control member blocks the flow of fluid from the source to the user device. An electrohydraulic moving arrangement is operative when electrically energized for moving the control member by applying hydraulic force thereto. A restoring arrangement is operative for applying to the control member a restoring force tending to move the control member to said neutral position when the electrohydraulic moving arrangement is electrically unenergized. An electrical control arrangement controls the electrohydraulic moving arrangement and includes a source of electrical power having two ter-

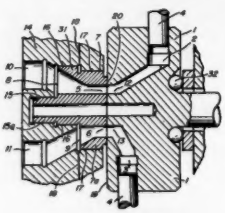
minals, connectors connecting the source of electrical power to the electrohydraulic moving arrangement for furnishing electrical energy to the latter, a remote control arrangement and an electrical control cable having a first cable end connected to the electrohydraulic moving unit and a second cable end connected to the remote control arrangement, the control cable comprising a first conductor having at the first cable end a first end connected to one terminal of the source of electrical power and having a second end at the second cable end, a second conductor extending along the length of the cable and having a first end at the first cable end and a second end at the second cable end. A fail-safe unit prevents electrical energization of the electrohydraulic moving arrangement when a short-circuit develops between the first and second conductors, to prevent the application by the electrohydraulic moving arrangement of hydraulic force to the control member and to thereby cause the control member to be returned to the neutral position by the restoring means.

3,831,496

PRESSURE RESPONSIVE CONTROL BODY ARRANGEMENT

Kearl Eickmann, 2420 Isshiki, Hayama-machi, Japan

Filed Mar. 30, 1972, Ser. No. 239,551
Claims priority, application Austria, Apr. 7, 1971, 2987/71
Int. Cl. F04b *1/00*
U.S. Cl. 91—487 **8 Claims**



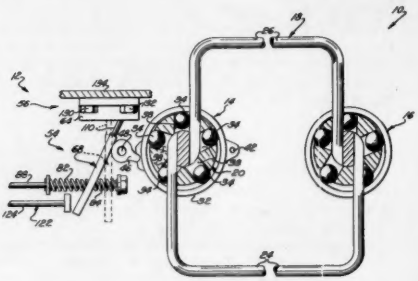
A pressure responsive control body arrangement is provided in a fluid handling device thereby, that axially of one end of the fluid handling rotor which contains the fluid intaking and expelling working chambers a pressure responsive fluid flow control body is adapted against the rotary control face of the rotor to seal with its stationary control face along said rotary control face while said control body is partially contained in a fluid containing pressure chamber; axially moveable therein in a limited extend, forming separated portions of said pressure chamber therein and having a cylindrical but radially eccentrically located portion or control body shoulder extending into a respectively located portion of said pressure chamber and sealing therein one portion of the fluid containing chamber from another portion thereof, while in order to locate the pressure centre of said eccentric portion of said control body at the same position relatively to the axis of the rotor of the device as the control faces between said rotor and said control body have, the eccentric shoulder of said control body partially extends radially over the outer diameter of said control faces. This location of the eccentric shoulder of the invention provides a smooth running of the control faces along each other whereby tilting or sticking between them is effectivley prevented, so, that the control mirror between the rotary and the stationary control faces of the device operate at high efficiency also at high pressures in fluid and high relative velocities between them.

3,831,497

HYDROSTATIC TRANSMISSION

Gerald W. Trabbic, Marshall; Wayne C. Dunn, Homer, and Paul E. Hakes, Battle Creek, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 22, 1972, Ser. No. 237,149
Int. Cl. F01b *1/06*
U.S. Cl. 91—497 **22 Claims**



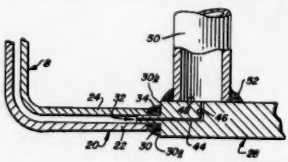
An improved neutral locate and hold assembly is operable to move a displacement control cam for a pump unit of a hydrostatic transmission to a neutral or minimum displacement position and to yieldably retain it there upon movement of the cam to a position closely approximating the neutral position by a manually actuatable control lever. The neutral locate and hold assembly also retards oscillatory movement of the pump displacement control cam under the influence of any hydraulic pulses which may be generated during operation of the hydrostatic transmission. Upon operation of an override or panic stop mechanism, the neutral locate and hold assembly also functions to position and hold the displacement control cam at the neutral position. A linkage interconnecting the control lever and the neutral locate and hold assembly includes a pair of links which are yieldably interconnected by springs to enable the control lever to be moved through a relatively wide range with the pump in a neutral position. The neutral locate and hold assembly may be adjusted to precisely position the displacement control cam at neutral.

3,831,498

MULTIPLE-PLY BELLOWS

Edward F. Harrington, Jr., Louisville, Ky., assignor to Chemetron Corporation, Chicago, Ill.

Filed Apr. 26, 1973, Ser. No. 354,692
Int. Cl. F16j *3/00*
U.S. Cl. 92—34 **8 Claims**

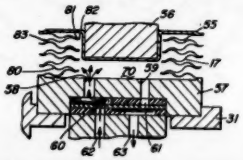


An end of a bellows having radially spaced inner and outer plies is mounted to a support having a wall and further having a tubular flange extended from the wall and inserted between the plies. Cylindrical weldments, preferably butt weldments, are deposited on the flange to weld the inner and outer plies to the support.

3,831,499
GAS PUMP EMPLOYING ELECTRON BEAM WELDED BELLOWS

Arthur J. Andrews, Harwichport, Mass., and Paul J. Luther, Ft. Lauderdale, Fla., assignors to Compressive Industries, Inc., Ft. Lauderdale, Fla.

Filed Aug. 16, 1972, Ser. No. 281,122
Int. Cl. F01b 19/00; F16j 3/00
U.S. Cl. 92—45 1 Claim

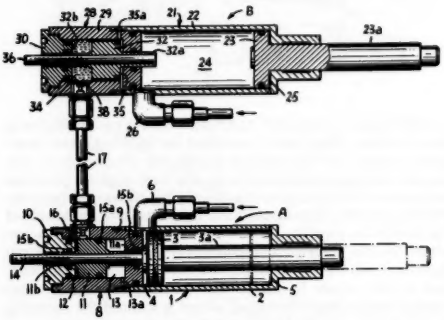


A gas compressor/vacuum pump has an electron beam welded bellows defining a compression chamber. The diaphragms of the bellows are welded at lap joints with the joint thicknesses preferably being no more than the thickness of the diaphragms so as to allow full compression of the bellows and thus optimize volumetric output and compression ratio. A method of forming the bellows includes electron beam welding on continuous seam paths to form bellows with highly precise concentricity.

3,831,500
APPARATUS FOR EFFECTING OSCILLATORY MOVEMENT OF AN OUTPUT MEMBER

Yoshiaki Kitamura, Kamagaya-machi, and Shigemi Misono, Tokyo, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Oct. 13, 1972, Ser. No. 297,355
Claims priority, application Japan, Oct. 13, 1971, 46-80674
Int. Cl. F01b 11/02, 9/00, 7/04
U.S. Cl. 92—68 8 Claims

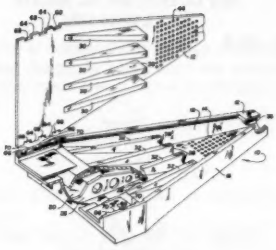


An apparatus for effecting oscillatory movement of an output member comprises a pair of single-acting fluid reciprocatory motors each having a working piston reciprocal through a working stroke and a return stroke and the motors are alternately supplied with motive fluid to effect synchronous reciprocation of the working pistons in opposite stroke directions. Each working piston is connected to a common roller chain and the roller chain engages with chain sprockets around the periphery of the output member so that alternate movement of each working piston through its working stroke drives the roller chain in opposite directions to thereby impart oscillatory movement to the output member. A dampening device is connected to each reciprocatory motor to dampen the impact of each working piston at the end of both its working and return strokes.

3,831,501
SHEET PLICATING DEVICE

Richard E. Bevington, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 16, 1973, Ser. No. 379,533
Int. Cl. B31f 1/08
U.S. Cl. 93—1 C 22 Claims

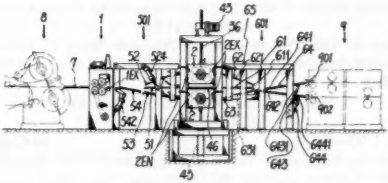


Plicating device or jet for receiving a material in continuous, band, ribbon or sheet-like form, uniformly plicating and compacting the material into a shape of relatively low cross-sectional area, and presenting the plicated and compacted material through an exit for further processing. The jet folds and condenses the material so that the axis of the fold is generally parallel to the direction of travel of the material. The position and amplitude of each fold as well as the degree of compacting is highly controlled. The device is formed to provide a slot-like band inlet communicating with a venturi connected to a gas inlet to transport the band to a folding cavity having nested vanes around which the band is plicated along its direction of travel.

3,831,502
SLITTER SCORER APPARATUS

Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co. Ltd., Osaka, Japan

Filed Jan. 29, 1973, Ser. No. 327,572
Claims priority, application Japan, Feb. 25, 1972, 47-19443; Apr. 5, 1972, 47-34700
Int. Cl. B26d 3/08
U.S. Cl. 93—1 G 24 Claims



The present disclosure is directed to a slitter scorer apparatus which slit and flutes, along a running direction, long and flat materials which are successively delivered. More particularly, the present disclosure is concerned with a slitter scorer apparatus comprising a rotary shear which cuts the flat materials at a right angle direction with their running

direction, two slitter scorers which are vertically placed downstream of the rotary shear, a front guide which guides the materials from the exit of the rotary shear to either entrance of the two slitter scorers or to an opening entrance between the two slitter scorers, and a rear guide which guides the material from either exit of the two slitter scorers or from an opening entrance between the two slitter scorers to the next process step.

3,831,503

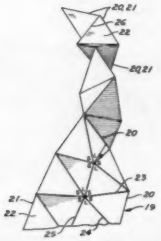
METHOD OF MAKING CELL STRUCTURE

George V. Tranquillitsky, 3161 Lynde St., Oakland, Calif. 94601

Division of Ser. No. 91,384, Nov. 20, 1970. This application May 14, 1973, Ser. No. 360,335

Int. Cl. B31d *5/04*

U.S. Cl. 93—84 R **11 Claims**



A cell structure and method of fabricating the same. Cell structures embodying the invention may be used to fabricate panels, beams, and like components having utility in a great number of environments such as in the construction of side, floor and ceiling walls of a building and of material-handling pallets. Any such panel or beam structure comprises a plurality of sub-components or segments each constituted of a number of cells, with all of the segments forming any such panel or beam being connected one with another so as to define a panel or beam having the desired dimensions. Each such segment includes a plurality of cells in the form of substantially closed polyhedrons hingedly connected one with another in a string-like succession thereof; and each such string of polyhedrons is fabricated by scoring a continuous web of flat paper or paper-like material which is then folded along the score lines into a continuous string of interconnected polyhedrons. The folded web is then adhesively or otherwise constrained in the folded condition thereof to maintain the string-like succession of interconnected polyhedrons.

3,831,504

SPIKE-MOUNTING STACKED-BAGS PROCESS AND APPARATUS

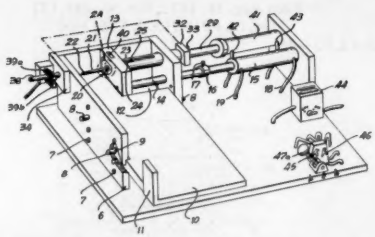
William P. Daly, White Plains, N.Y., and Oliver L. Pouliot, Oradell, N.J., assignors to Oneida Packaging Products, Inc., Clifton, N.J.

Filed Jan. 15, 1973, Ser. No. 323,749

Int. Cl. B31b *1/98*

U.S. Cl. 93—93 M **16 Claims**

The bag-mounting process and apparatus of the invention are directed to a spearing of stacked paper bags onto a needle-like spike rammed through stacked lips thereof with the spike piercing the lips from the lips' outer faces thereof near the lips' upper peripheries after first compressing the stacked lips in the stacked state, employing solely a linear spike having a concentrically tapered point at its piercing end and a blunt opposite end against which a plunger is pressed to ram the spike from a spike-supporting barrel aligned perpendicularly to the point for piercing, and mounting tabs or other retaining members on the opposite ends of the spike for retaining the pierced-bags on the spike against bags' tendency to slip-off during handling and shipping. Preferably the machine is pneumatically actuated and semi-automatic for at least part of the process, and is adjustable to receive bag-stacks of different widths of the bags thereof.



3,831,505

DEVICE FOR DETERMINED BATCH-WISE COLLECTION AND DISCHARGE OF ARTICLES

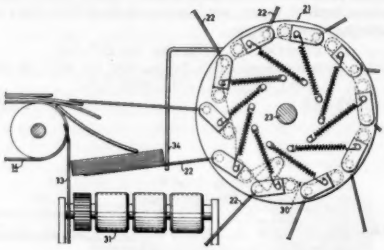
Gunnar Skogsberg, Gosta Ekmans Vag 22, Hagersten, Sweden

Filed Mar. 5, 1973, Ser. No. 338,167

Claims priority, application Sweden, Mar. 10, 1972, 3097/72

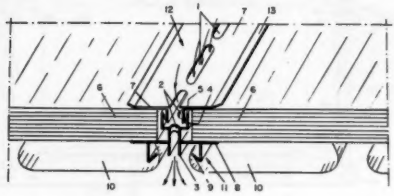
Int. Cl. B31b *1/98*

U.S. Cl. 93—93 DP **4 Claims**



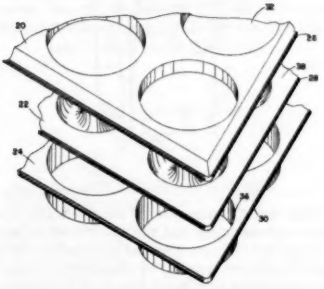
A device for determined batch-wise collecting and discharging of articles, in a printing machine for allowing direct automatic transfer of the printed articles for binding in a subsequent binding machine, at least one web of paper provided with prints at predetermined places being discharged from the printing machine in order to form the successive signatures of the book to be produced, said device comprising a distribution wheel having receiver compartments for receiving the cut signatures which are discharged from the printing machine, and a star wheel having cam-controlled collecting wings wherein below the distribution wheel is located the receiving end of a substantially horizontal discharge conveyor, running in the direction of the rotational axis of said distribution wheel and adapted to support in maintained order and in a precisely controllable manner the signatures deliverd by the distribution wheel in a continuous overlapping sequence and carry them to the star wheel at the discharge end thereof, said star wheel being mounted on a horizontal axis transversely to the direction of discharge of said signatures and adapted to rotate in a direction opposite to that of said discharge conveyor, the signatures supported by the latter being located with such mutual edge spacing that an absolutely reliable desired collection and separation of the signature sequence is allowed by the wings of said star wheel.

3,831,506
COMPOSITE VENTILATION MEMBER FOR CEILING COVERINGS
Hugo Arie Johan Landbeer, Rotterdam, Netherlands, assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles
Filed Nov. 21, 1972, Ser. No. 308,404
Int. Cl. F24f *7/00*
U.S. Cl. 98—41 **14 Claims**



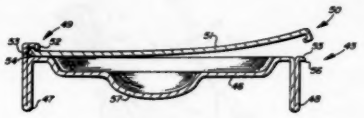
A ventilation member composed of top and bottom component sections, which sections have holding flanges to secure sound-absorbing material between the sections, provides an economical and efficient ventilating system. The component sections are easily fastened, their design facilitates subsequent installation, and each component section has air passage openings.

3,831,507
BAKING PAN ASSEMBLY
Donald S. Wheaton, 3521 Medina, Columbus, Ohio 43224
Filed Aug. 10, 1972, Ser. No. 279,684
Int. Cl. A21d *13/00*; A23p *1/00*
U.S. Cl. 99—428 **2 Claims**



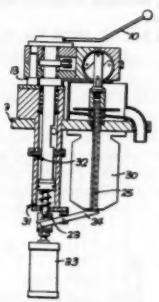
A baking pan assembly and a method of using same to make a sandwich bun having separate upper and lower portions. The assembly and method is characterized by an arrangement of three baking pans in vertical substantially sealed relationship. The middle pan in this assembly has a unique shape which not only forms a bowl-like recess in the lower portion of the bun but contributes in the baking process to permit the lower surface of the top portion of the bun and the interior surface defining the recess in the lower portion of the bun to be fully baked in a soft, unbrowned condition.

3,831,508
EGG BOILER OR COOKER
John J. Wallard, P.O. Box 1053, Scottsdale, Ariz. 85252
Filed May 25, 1972, Ser. No. 256,892
Int. Cl. A47j *43/18*
U.S. Cl. 99—440 **3 Claims**



An egg boiler or cooker within which a shelled egg can be cooked so that the egg is hard boiled and conformed to a predetermined shape in a rack for use in a toaster, oven or in boiling water.

3,831,509
PROCESSING APPARATUS
Clement Pierre Collet, 207 Avenue di Roule, Neuilly Sur Seine, France
Filed Mar. 21, 1972, Ser. No. 236,671
Int. Cl. A23n *3/12*
U.S. Cl. 99—542 **15 Claims**

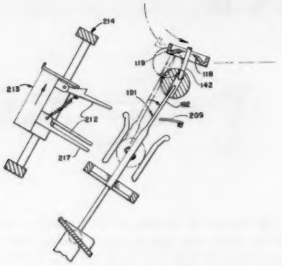


The specification discloses an apparatus for hollowing out bodies comprising a post, a clamp mounted for rotation about the post but fixed against movement along the post, a support, means to mount the post for sliding movement in a longitudinal direction on the support, means to open and close the clamp with rotation of the clamp about the post and a radially expansible cutter mechanism for hollowing out a body which cutter mechanism is located in the path of movement of the clamp when the clamp is closed and the post is slid longitudinally with respect to said support whereby the cutter mechanism is brought into operation on a body held by the clamp.

3,831,510
MACHINE FOR SEED CELLING PREVIOUSLY CORED APPLES
Malcolm W. Loveland, Orinda, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.
Filed Aug. 25, 1972, Ser. No. 283,919
Int. Cl. A23n *3/08*
U.S. Cl. 99—553 **11 Claims**

Apples which have been peeled and cored as with the machine shown in U.S. Pat. No. 3,586,081 are discharged to an inspection station where they are inspected and any trimming required is done by hand. The apples selected for

slicing are then sent on in bulk to the machine of the present invention wherein they are oriented, utilizing the cored hole in the apple, following which they are transferred from the orienting mechanism, taking advantage of the alignment provided by the cored hole. After the transfer they are moved to a station where they are cut to remove the fibrous carpel material surrounding the seeds together with the seeds. Following this operation, the apples are cut into segments as desired.

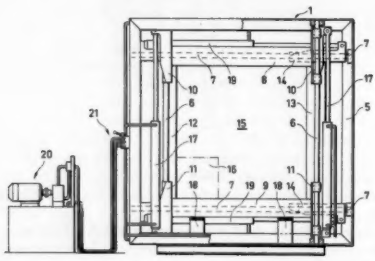


3,831,511

DEVICE FOR PRESSING TOGETHER GOODS SUPPORTED ON CONVEYOR

Karl Johan Back, Helsinki, Finland, assignor to Oy Cylop AB, Helsinki, Finland

Filed Jan. 30, 1973, Ser. No. 328,871
Int. Cl. B65b *63/02*
U.S. Cl. 100—7 **5 Claims**



The goods are pressed together in vertical direction by preventing an upper surface of the goods from rising and by subjecting a part of the goods not supported by the conveyor to an upward compression force, whereby no compression is directed at the conveyor itself.

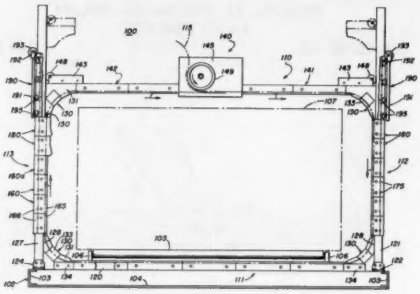
3,831,512

STRAP FEED TRACK WITH FLUID-ACTUATED STRAP END POSITIONING MEANS

Robert A. Johnson, Flossmoor, Ill., assignor to Interlake, Inc., Chicago, Ill.

Filed Dec. 26, 1972, Ser. No. 318,634
Int. Cl. B65b *13/06*
U.S. Cl. 100—26 **15 Claims**

A binder strap track includes a stationary section and a movable section movable therealong for varying the track length, each section comprising a backing wall having a strap guide surface and a retainer cooperating therewith to define a strap path. A discontinuity in the strap guide surface is formed at the junction of stationary and movable sections thereof. The stationary section of the backing wall has an elongated slot therein adjacent to the discontinuity. Disposed in the slot is a fluid conduit, substantially rectangular in transverse cross-section, with the outer wall thereof perforated and having an outer surface thereon substantially coplanar with the adjacent portions of the stationary section of the strap guide surface. Compressed air is introduced into the conduit and produces jets of air through the perforation for urging the associated strap away from the strap guide surface and the discontinuity therein and toward the strap retainer.

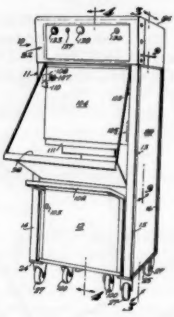


3,831,513

PORTABLE SOLID WASTE COMPACTOR

Philip Tashman, 4800 Ronda, Coral Gables, Fla. 33146

Continuation-in-part of Ser. No. 154,575, June 18, 1971, abandoned. This application Nov. 1, 1972, Ser. No. 302,846
Int. Cl. B30b *15/14*
U.S. Cl. 100—52 **7 Claims**



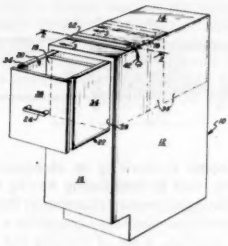
A portable waste compactor for automatically compressing used paper cartons, cans and the like refuse or waste into a compact mass for efficient disposal is described. An automatically recycling worm gear drive mechanism reciprocatively drives a compacting ram down into a dolly-supported refuse container with a stroke varying in accordance with the reactive force of the waste material being compacted. An electrical interlock prevents operation of the compactor upon removal of the dolly-supported container for easy withdrawal and transport of waste compacted therein. The throat of the refuse chute is equipped with a guard gate cooperatively associated with the ram so as to close the refuse chute opening upon downward compacting movement of the ram to prevent the placing of a person's hand under the ram while in its downward stroke, and operative to stop the ram on its downward stroke if the gate is obstructed in an open position by the hand or by a piece of refuse accidentally jammed

between the side portion of the ram and an outer portion of the refuse chute. The period of repetitive recycling can be varied over wide time interval for adjustment to a rate in keeping with that at which waste is being supplied to the device for compaction.

3,831,514
DEODORIZED GARBAGE COMPACTOR AND APPURTENANCES

Karl W. Jernstrom, 22 Island Trl., Sparta, N.J. 07871

Filed Jan. 7, 1972, Ser. No. 216,007
Int. Cl. B30b *9/00*
U.S. Cl. 100—70 **6 Claims**

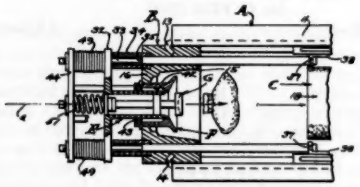


A garbage compactor and appurtenances, loading hoppers, conveyor chutes and the like having a source of ultra-violet light mounted to irradiate the light upon garbage as well as the space through which garbage is passed, contained, or compressed, the irradiation being effective to destroy garbage odors emanating from the garbage or garbage-contaminated surfaces.

3,831,515
METHOD FOR CORING AND PRESSING JUICE FROM FRUITS HAVING A RIND

Roger J. Breton, Los Angeles, and David F. Beck, San Juan Capistrano, both of Calif., assignors to Roto Manufacturing, Inc., Westminster, Calif.

Division of Ser. No. 55,538, July 16, 1970, Pat. No. 3,682,092. This application Aug. 7, 1972, Ser. No. 278,281
Int. Cl. A46j *19/02*; **B30b** *9/02*
U.S. Cl. 100—37 **14 Claims**

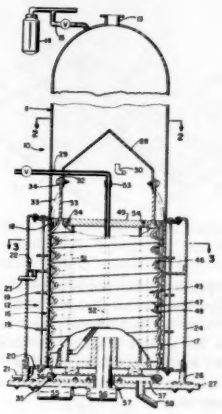


A method for juicing fruit having a rind and varying in hardness and size, and comprising generally the steps of supporting a said fruit, cutting an opening through the rind at one side thereof, then confining the said fruit and applying external pressure thereto thereby extruding a core through the opening cut through the rind and delivering the juice from said fruit via said opening and through said extruded core.

3,831,516
CONTINUOUS PRESS

Wallace J. S. Johnson, Berkeley, Calif., assignor to Upright, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 192,545, Oct. 26, 1971, abandoned. This application Oct. 12, 1972, Ser. No. 297,000
Int. Cl. B30b *9/06, 9/12*; **B20b** *5/02*
U.S. Cl. 100—116 **31 Claims**

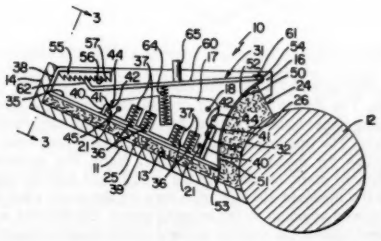


A continuous press comprising a tubular apertured screen and a cylindrical sleeve disposed coaxially within the screen, the sleeve being held against rotation relative to the screen. One or more annular or helicoidal ripples are repeatedly formed on and around the outer surface of the sleeve. The pressure applied to the wet pulp entering the press and the compressive action of the rippling sleeve outwardly towards the screen combine to move the wet pulp lengthwise of the screen while progressively compressing the pulp to squeeze the juice therefrom.

3,831,517
FOUNTAIN DIVIDER

William T. Wagner, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Dec. 22, 1972, Ser. No. 317,877
Int. Cl. B41f *31/06*
U.S. Cl. 101—208 **14 Claims**

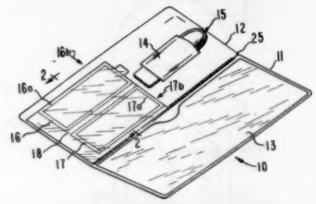


A fountain divider for printing press ink fountain systems which holds or separates ink within the fountain and has means enabling such divider to be used with associated rotatable cylindrical fountain rollers of different diameters.

3,831,518
PORTABLE IMPRINTER

Gary L. Pittman, Phoenix, Ariz., assignor to G.B. Frank Incorporated, Chicago, Ill.

Continuation of Ser. No. 104,649, Jan. 7, 1971, abandoned.
This application Apr. 25, 1973, Ser. No. 354,216
Int. Cl. B41a 8/06
U.S. Cl. 101—368 7 Claims

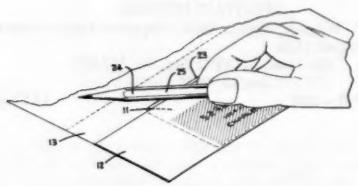


A portable imprinter comprises two covers joined by a flexible hinge with first and second receptacles for embossed cards placed on the inside surface of one cover and overlaid by a third receptacle for a sales ticket. Information on the cards placed in the first and second receptacles is transferred to the sales ticket by rubbing the sales ticket with an imprinting tool carried in the imprinter.

3,831,519
MAIL ORDER SALES DEVICE METHOD

Edward L. Fischer, Indianapolis, Ind., assignor to The Indiana National Bank, Indianapolis, Ind.

Division of Ser. No. 234,211, March 13, 1972. This application Dec. 18, 1972, Ser. No. 315,808
Int. Cl. B41m 3/00; B41l 47/04
U.S. Cl. 101—426 2 Claims

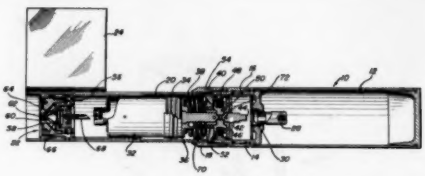


A device and method for mail order sales utilizing credit cards. The device is a paper construction having a piece of imaging paper secured thereto forming a credit card receiving pocket. The imaging paper is separable from the paper construction for mailing with the order form. The method includes the steps of inserting the credit card into the pocket with the upraised identification data on the credit card being positioned adjacent to the imaging paper. An element is then rubbed against the exterior surface of the imaging paper so as to force the interior surface of the imaging paper against the upraised identification data to transfer and store an image of the data on the imaging paper. The credit card is then removed and the imaging paper is removed from the paper construction and mailed to the seller along with the order form.

3,831,520
BIOLOGICAL BOMB

Russell J. Bowen, Boston; William B. Ford, Jr., Winchester; Ralph D. Sanborn, Norwell; Winslow A. Sawyer, East Braintree; John R. Sharp, North Quincy; Herbert E. Soini, Hingham; Benjamin A. Lambert, Marshfield Hills, and David B. Lull, Lexington, all of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 10, 1958, Ser. No. 727,754
Int. Cl. F42b 25/12
U.S. Cl. 102—6 5 Claims

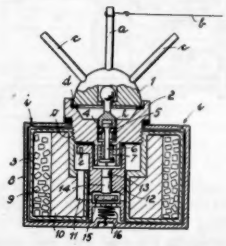


1. An aerosol bomb comprising an elongated cylindrical casing, a transverse wall in said casing having a rupturable diaphragm and defining a pressure chamber in the front end of said casing, said pressure chamber containing a compressed normally gaseous medium, a set of rotating tail vanes and a nozzle in the opposite end of said casing, a flexible sealed aerosol container within said casing adjacent said nozzle, penetrating means, within said casing, associated with said nozzle and adapted to penetrate said flexible container and conduct its contents to said nozzle, spring biased inertia means between said pressure chamber and said flexible container, said inertia means being held against the bias of the spring by means of centrifugally disengaging pawls, said inertia means serving to move forward, upon impact of the bomb, to penetrate said rupturable diaphragm and to release the gaseous pressure medium in the pressure chamber, said spring bias serving to force the inertia member in the opposite direction to impale the flexible aerosol container on the penetrating means whereby the released gaseous pressure from the pressure chamber serves to collapse said flexible container and expel its contents through the nozzle.

3,831,521
MECHANICAL-PYRIC DEVICE UTILIZABLE IN THE TYPE OF ANTI-MAN MINES WITH A WIDE ACTION RANGE AND GUSHING OUT FROM THE GROUND

Federico Engeli, Lugano, Switzerland, assignor to Technical Arco Establishment, Schaan, Liechtenstein

Filed Feb. 14, 1973, Ser. No. 332,494
Int. Cl. F42b 23/10
U.S. Cl. 102—8 6 Claims



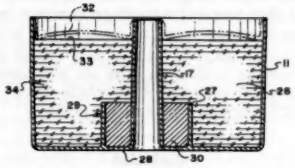
The mechanical device may be applied to anti-personnel mines of the type ejected from the ground by a throw-charge

and deflagrated in the air by an explosive charge to cover a wide action range. The device comprises an igniter operable by either pressure or traction, and a throw bowl concealable in the ground and enclosing an ejectable body containing all the other components of the mine including a throw charge, an explosive charge, a firing pin for the throw charge, and a firing pin for the explosive charge. The igniter is disengageably connected to the ejectable body, and the firing pin for the throw charge is connected to the igniter and is operable to ignite the throw charge responsive to pressure or traction on the igniter. A detonator is provided for the explosive charge, and the ejectable body encloses a mounting member, mounting the firing pin for the explosive charge in a stable position spaced substantially from the detonator and a substantial distance out of alignment with the detonator. A flexible tensile member interconnects the mounting member and the throw bowl. When the throw charge is ignited to eject the body from the throw bowl, the tensile member exerts a restraining force on the mounting member which causes the firing pin for the explosive charge to be moved into alignment with the detonator and then impacted against the detonator when the ejectable body is a pre-selected distance above the throw bowl.

ERRATUM

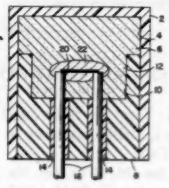
For Class 102—23 see:
Patent No. 3,832,249

3,831,522
EXPLOSIVE BOOSTER AND CONTAINER THEREFOR
Russell H. Romney, 3259 Bon View Dr., Salt Lake City, Utah 84109
Filed Mar. 2, 1973, Ser. No. 337,434
Int. Cl. F42b *3/10*
U.S. Cl. 102—24 R **8 Claims**



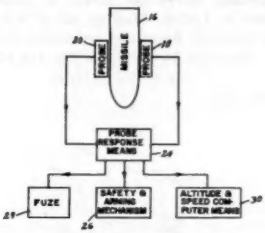
A plastic shell or container casing for explosive charges, particularly small explosive charges of higher sensitivity, is injection molded in parts with sufficient precision that it can be assembled with liquid-tight joints without adhesives or heat-sealing. The casing or shell is formed with one or more integral tubes or recesses for receiving an initiator or primary detonator, such as a blasting cap or a detonating cord, or both. The separate parts of the container may be formed as a main receptacle and a closure, or as two half-casings or containers, or in other minor and major part combinations. The parts are designed with tight frictional connections but may include locking or semi-locking joints, to resist unauthorized tampering as well as to protect the contents against intrusion of water or other external liquids. Design features preferably include an inner structure or receptacle for holding a core of hypersensitive explosive, capable per se of detonation by a small initiator, to magnify the initiatory detonation and thus set off a surrounding charge of less sensitive material which could not be reliably detonated per se by the primary initiator.

3,831,523
ELECTROEXPLOSIVE DEVICE
William B. Thomas, and Robert E. Betts, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Jan. 4, 1967, Ser. No. 607,603
Int. Cl. F42b *3/12*
U.S. Cl. 102—28 R **6 Claims**



An electroexplosive device having its major components, namely the casing, lead wire, bridgewire, and explosive composition all formed of "low Z" elements, i.e., elements having a sufficiently low atomic number which defines only those elements which are transparent to X-ray energy. That is, the X-ray energy may pass readily therethrough, rather than to be absorbed, thereby reducing the hazards that the X-ray normally present to the proper functioning of the device.

3,831,524
MISSILE DEVICE RESPONSIVE TO AERODYNAMIC CONDITIONS
Irvin Pollin, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 21, 1957, Ser. No. 641,782
Int. Cl. F42c *13/02*
U.S. Cl. 102—70.2 P **2 Claims**



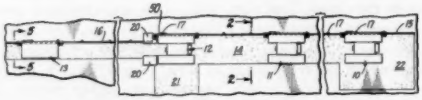
In combination with a ground-to-ground ordnance missile having a predictable trajectory during which the missile attains a supersonic velocity, improved means for obtaining an activating signal at a predetermined altitude prior to impact and after the missile has begun to decelerate, said means comprising in combination: first and second heat-responsive probes mounted to the exterior surface of said missile such that the aerodynamic heating of said probes during missile flight are highly independent of the surface conditions of the missile and missile geometry, each probe being located at the same distance aft of the missile nose so as to be exposed to the same aerodynamic heating conditions during missile flight, said probes being so constructed that said first probe has a heat capacity which is substantially different from the heat capacity of said second probe, said probes thereby having substantially different time-temperature relationships during missile flight, the heat capacities of said probes further being

chosen in conjunction with predicted values of missile velocity, ambient air density and ambient air temperature throughout the missile trajectory so that the instantaneous temperature of said probes will become equal at said predetermined altitude, and probe-responsive means within said missile connected to said probes for producing an activating signal when the instantaneous temperatures of said probes become equal, said probe-responsive means including an electronic bridge-type circuit for sensing the temperatures of said probes by sensing their resistivities.

3,831,525
AUTOMATED ASSEMBLY LINE WITH AIR CUSHION DEVICES

Robert E. Burdick; Terry M. Baker, and Baxter K. Wolfe, all of Santa Barbara, Calif., assignors to Rolair Systems Inc., Santa Barbara, Calif.

Filed Jan. 26, 1973, Ser. No. 326,792
Int. Cl. B61b *13/08*
U.S. Cl. 104—23 FS **5 Claims**

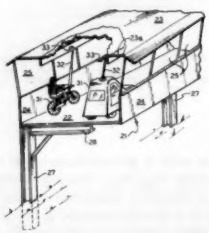


An assembly line with a plurality of self propelled air cushion transporters for moving large loads through an assembly area. An automatic control system with a plurality of control points, with the transporters moving continuously except when a stop signal is provided at a control point. A programmable automatic control can program the transporter movement for an entire shift and provide transporter movements at predetermined intervals, typically 2 minutes.

3,831,526
VIADUCT FOR SMALL, POWERED, PASSENGER VEHICLES

Paul W. Howells, Morrisville; Edwin H. Lederer, Syracuse, and Robert N. Lothes, Manlius, all of N.Y., assignors to Syracuse University Research Corporation, Syracuse, N.Y.

Filed Oct. 26, 1973, Ser. No. 410,165
Int. Cl. E01b *25/08*
U.S. Cl. 104—121 **10 Claims**

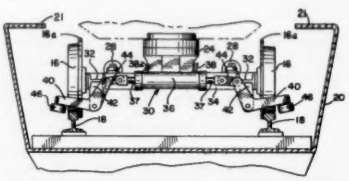


The viaduct comprises an enclosed and windowed way or flat road, wide enough for two vehicles abreast, the vehicles each having a forwardly and upwardly extending mast. The way is elevated and is arranged in successive portions comprised of comparatively long downwardly sloping portions followed by comparatively short upwardly sloping lift portions having overhead, endless belt means engageable by friction pad means at the upper ends of the vehicle masts for towing the vehicles up the lifts to another downward slope where the vehicle is released to coast or be driven by power furnished by the driver or by a battery powered electric motor. Entrance and exit ramps are provided for entering vehicles and for those leaving for street level. The lift belt is stainless steel supported on drive rollers and a low friction slider bed. The friction pad is offset from the mast and comprises a pad with a rubber working surface layer lying adjacent another body having a surface of low friction material, the pad being spring-biased downward against the belt by novel lever means to prevent excessive initial friction of the pad with the belt in the case of a low speed entry of a vehicle to the lift. Ceiling supported guide rails are provided at each side of the downslopes and similar converging rails are provided for guiding the mast tops to the lift belts.

3,831,527
PASSENGER CAR SWITCHING DEVICE

William Hartin Peterson, Homewood, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed May 18, 1973, Ser. No. 361,676
Int. Cl. E01b *25/12*
U.S. Cl. 104—130 **3 Claims**

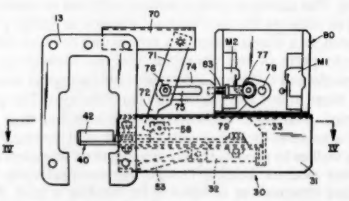


A vehicle mounted switching arrangement for use in a static switching track structure having no moving track sections whereby the passenger vehicle is moved laterally by engagement of the car mounted rail grabbing device to permit the flange of the wheel opposite the actuated rail engaging device to be spaced a short distance from the supporting rail. After the lateral movement of the vehicle the car is in position to move into a switch track which is positioned in the space between the wheel flange and main supporting rail. This switch track then permits the passenger vehicle to be switched off the main line and through a curved section into a second switch track. The rail grabbing mechanism which is mounted on the passenger vehicle includes an interconnected rail grabbing device on each side of the vehicle which permit only one rail grabbing arm to engage a track at a time.

3,831,528
PRESSURE RELIEVED TROLLEY STOP FOR CONVEYORS

Augusts V. Redlichs, Grand Rapids, Mich., assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed Sept. 13, 1973, Ser. No. 396,798
Int. Cl. B61k *7/18*
U.S. Cl. 104—252 **20 Claims**



A stop for conveyors for arresting the forward movement of an article such as a trolley at the time of or after its release

from the propelling mechanism of the conveyor. The stop has a member mounted for reciprocal movement into and out of the path of the article. The member includes an article engaging arm and a locking arm and a mechanism for removing the locking arm when the member is to be retracted from article interception position. Removal of the locking arm allows the article engaging arm to shift away from the article in the direction of travel of the article. The article engaging arm is then free to be retracted without interference from the article resulting from the pressure with which the article normally presses against the member.

3,831,529

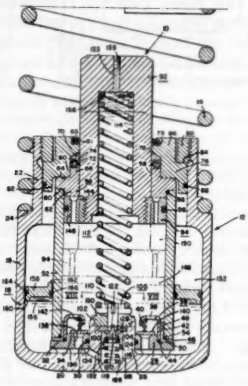
FLUID TRUCK SNUBBER

Stuart A. Schwam, 372 Robinson Dr., Broomall, Pa. 19008

Continuation-in-part of Ser. No. 300,109, Oct. 24, 1972, abandoned. This application Aug. 16, 1973, Ser. No. 388,785

Int. Cl. B61f *5/12*; **F16f** *9/06, 9/32*

U.S. Cl. 105—197 DH **24 Claims**



The truck of a railroad car or similar vehicle is provided with a hydraulic fluid single action piston and cylinder motion damping device located in each spring group, between the spring seat and the truck bolster. The device is provided with unvalved passages by means of which hydraulic fluid is bypassed around the piston head. As a consequence, the piston is capable of yielding to accommodate movement of the truck bolster regardless of the magnitude of the load applied by the truck bolster to the piston. The device is also provided with valved passages through which hydraulic fluid flows back and forth between a compression chamber and a reservoir in response to actuation of the piston.

In addition, the device may be provided with a piston which floats upon the hydraulic fluid in the reservoir. The floating piston is arranged for keeping the hydraulic fluid in the reservoir interposed between the air in the reservoir and said valved passages, irrespective of which end of the device is uppermost.

3,831,530

RAILWAY CAR CENTER BEARING ASSEMBLY

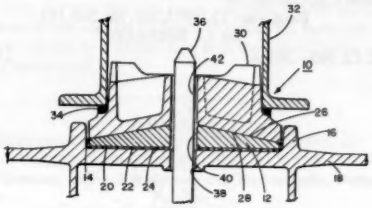
Geoffrey Wilton Cope, Williamsville, and Loren William Smith, Eggertsville, both of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 19, 1972, Ser. No. 298,965

Int. Cl. B61f *1/14, 5/16, 5/18*

U.S. Cl. 105—199 C **16 Claims**

A center plate assembly for railway cars including a detachably mounted center filler which may consist of one or more separate sections disposed between a body center plate and a truck bolster center plate bowl of the railway car, the bearing surfaces of the center filler having a hardness greater than the bearing surface of the truck center plate bowl and no



less than the hardness of the body center plate to produce a very low rate of wear. Also, means are provided to inhibit relative movement of all bearing surfaces except those required to move.

3,831,531

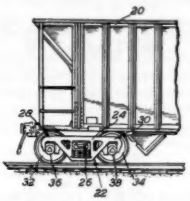
RETAINER KEY FOR PEDESTAL SIDE FRAMES

Herman D. Wresch, Wheeling, Ill., assignor to MacLean-Fogg Lock Nut Co., Mundelein, Ill.

Filed Mar. 16, 1973, Ser. No. 341,956

Int. Cl. B61f *5/28, 5/52, 15/20*

U.S. Cl. 105—221 K **6 Claims**

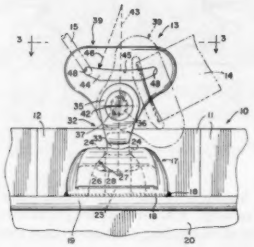


Key for retaining an axle bearing assembly between spaced vertical pedestal walls which define an open-bottomed jaw in a railway truck side frame on a railway car. The key has a one piece body consisting of a base portion, an inner retainer end portion and an upper stabilizing arm. The base portion is seated on an external flange on one of the pedestal walls and the bottom is formed to seat against upwardly and inwardly facing support surfaces on the flange to prevent downward and outward displacement of the key. The inner retainer end portion extends through an access opening in the pedestal wall above the flange and engages the underside of the axle bearing assembly to hold it in the jaw regardless of up and down oscillation of the railway car relative to the truck. The stabilizing arm extends upwardly from the base section and engages the outside of the pedestal wall above the access opening. A downward force exerted by the axle bearing assembly on the retainer end portion produces a force couple about an axis on the flange. This is resisted by an opposite, balancing reactive force couple about the same axis resulting from a thrust reaction between the stabilizing arm and the one pedestal wall. This holds the key stably in position to retain the axle bearing assembly in the jaw.

3,831,532
LADING TIE ANCHOR

Edward Payson Smith, Wilmette, and Rudolph E. Nadherny, Naperville, both of Ill., assignors to Illinois Railway Equipment Co., Chicago, Ill.

Filed Mar. 12, 1973, Ser. No. 340,184
Int. Cl. B61d 45/00
U.S. Cl. 105—369 A 2 Claims

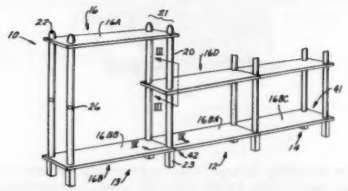


A lading tie anchor assembly for a railway car comprises a C-shaped retainer to be welded to the car frame and having a concave spherical surface engaged by a convex spherical surface of a trunnion the neck of which extends through the slot in the retainer with an endwise extending bifurcated section between the furcations of which one corner of a triangularly shaped link is pivoted. The link has a lading tie receiving slot along its side opposite the one corner the outer side of which is convexly curved and the ends are semi-circular.

3,831,533
SHELVING SYSTEM

Harlan F. Kellogg, Rockford, Ill., assignor to Kirsch Company, Sturgis, Mich.

Filed Aug. 21, 1972, Ser. No. 282,431
Int. Cl. A47b 57/00
U.S. Cl. 108—64 12 Claims

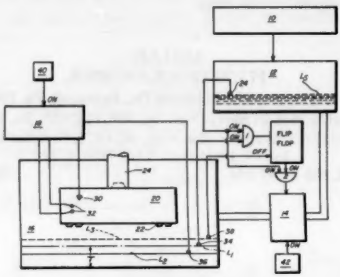


A free-standing shelf system comprises a plurality of shelves having passages through end portions thereof. A plurality of spindles support the shelves in spaced relation, the spindles having fastening elements extendible through the passages for axially interconnecting a pair of spindles with a shelf sandwiched therebetween. Interlocking tongue and groove portions on an opposed shelf surface and spindle end are provided. The tongue and groove portions are laterally adjacent the corresponding spindle fastening element and shelf passage for positively preventing lateral shifting of the shelf with respect to the spindles sandwiching same therebetween. The passage is circumferentially continuous opening through a shelf near the end thereof or alternatively is a circumferentially continuous opening formed at the juncture of two end abutting shelves by opposed, substantially hemicircular opening portions in the abutting shelf end edges. In the latter instance, the tongue and groove interlock prevents the abutting shelf ends from shifting apart laterally.

3,831,534
SEWAGE TREATMENT SYSTEM

Alan H. Cornish, Newington; Ronald E. DeLaney, and Robert B. Davis, both of New Britain, all of Conn., assignors to Koehler-Dayton, Inc., New Britain, Conn.

Filed July 2, 1973, Ser. No. 375,840
Int. Cl. F23g 5/12
U.S. Cl. 110—8 C 6 Claims

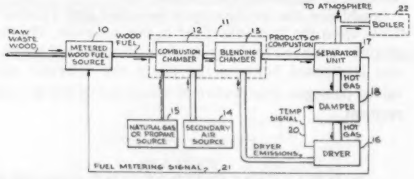


A sewage treatment system comprising a surge tank adapted to receive effluent from a recirculating toilet or the like, an incinerator including a housing, means for selectively and periodically delivering the effluent received in the surge tank to the incinerator housing, the incinerator further including a combustion chamber having a stack and means for directing the flames of combustion downwardly against the top surface of the sewage contained within the housing whereby the liquid component of the contained effluent will evaporate and pass through the stack thereby lowering the level of the contained effluent, means for turning off the incinerator when the level of the effluent contained in the incinerator housing is lowered to a predetermined level whereat a layer of effluent having a predetermined thickness will insulate the bottom of the incinerator housing from the flames of combustion.

3,831,535
WOOD WASTE BURNER SYSTEM

Andrew B. Baardson, Beaverton, Wash., assignor to Mill Conversion Contractor, Inc., Hillsboro, Oreg.

Filed Nov. 2, 1973, Ser. No. 412,474
Int. Cl. F23g 7/00
U.S. Cl. 110—8 C 15 Claims



The present invention provides a system by means of which waste wood, as well as the fumes emitted by veneer being dried, are burned in such a manner as to basically accomplish two things, namely, provide large amounts of heat energy that was formerly wasted and, secondly, substantially reduce the emission of pollutants into the atmosphere. The system finds particular application to the lumber mill industry.

3,831,536

SEEDBED AND METHOD AND MEANS FOR PREPARING SAME

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing, Inc., Lexington, Nebr.

Continuation-in-part of Ser. No. 104,405, Jan. 6, 1971. This application Aug. 14, 1972, Ser. No. 280,729
Int. Cl. A01c *1/00*
U.S. Cl. 111—1 3 Claims

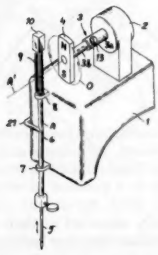
A tool bar having a plurality of spaced apart ground working assemblies including a furrowing shovel with outwardly and rearwardly extending vertically adjustable mold boards on opposite sides thereof. The outer ends of the mold boards have an upper convex forwardly rounded surface and a rear edge which extends forwardly and downwardly and meets at a vertex with an upwardly and longitudinally inwardly extending rear edge on a cutting blade extending along the bottom of the mold board. The mold boards are supported independently of the furrowing shovel and the outer ends of adjacent mold boards are closely spaced to form a ridge such that seed is planted on a ledge between the valley formed by the furrowing shovel and the ridge formed by adjacent mold boards. The ground working assemblies may be spaced apart to provide alternate spacing between rows of 20 and 30 inches with the ridges being on the centerline of the 30 inch spacing and the troughs being on the centerline of the 20 inch rows. A wheel having a V-shape in cross section peripheral edge may be mounted on the tool bar for forming a small trough in the ridge. The small trough has a bottom higher in elevation than the ledge on which the seed is planted. The method of producing row crops includes planting the seed of the first crop in rows utilizing the alternate narrow and wide spacing, harvesting the crop and planting the seed for the second crop with the wide rows having the same centerline as the narrow rows of the first crop and the narrow rows of the second crop having the same centerline as the wide rows of the first crop. The root structure of the first crop is left in the ground to help prevent soil erosion and allow for more time to decay.

3,831,537

DRIVE FOR SEWING MACHINE OR THE LIKE USING MAGNETIC FORCE TRANSMISSION

Sidney Siegel, 989 Schenectady Ave., Brooklyn, N.Y. 11203

Filed Apr. 12, 1973, Ser. No. 350,373
Int. Cl. D05b *55/14*
U.S. Cl. 112—220 9 Claims



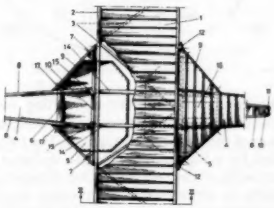
A drive for a sewing machine or the like has a first body which is linearly displaceable in a linear guide adjacent the orbit of a second rotatable body. At least one of the bodies is magnetized and the other is magnetically entrainable so that, as the second body is rotated adjacent the first body, this first body is linearly displaced. A spring or the like can be provided to return the first body whereby the rotary motion of the second body is converted into linear reciprocation of the first body. Both bodies can be magnetic and the first body can be part of or carried by a needle bar, with the second body carried by a motor shaft.

3,831,538

FLOATING STRUCTURE FOR THE MOORING OF YACHTS AND OTHER SIMILAR CRAFT

Pieter Meeusen, Barendrechtseweg 30, Barendrecht, Netherlands

Filed Oct. 24, 1972, Ser. No. 300,392
Claims priority, application Netherlands, Oct. 28, 1971, 7114866
Int. Cl. B63b *35/00*
U.S. Cl. 114—.5 BD 6 Claims



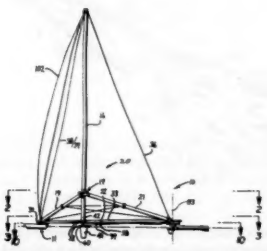
A floating structure for the mooring of yachts and similar craft, comprising en elongated main jetty and a number of landing platforms attached to said main jetty and protruding therefrom, in which the landing platforms are considerably wider adjacent to the main jetty than at any distance away from it, the greater part of the buoyancy of both main jetty and landing platforms being formed by a float below the main jetty and the landing platforms in the area where their axes intersect. Moreover there are rigid beams below the main jetty protruding therefrom and supporting the jetty and the landing platforms and connected to the float structure underneath.

3,831,539

WIND-PROPELLED APPARATUS

Robert Bruce Black, 1250 34th Ave., San Francisco, Calif. 94122

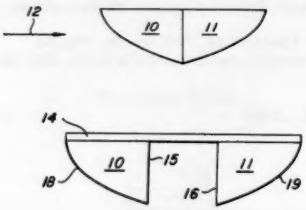
Filed Aug. 31, 1972, Ser. No. 285,461
Int. Cl. B63b *35/00*
U.S. Cl. 114—39 6 Claims



A wind-propelled apparatus for surface travel is provided having a frame with a triangular sail secured at its three cor-

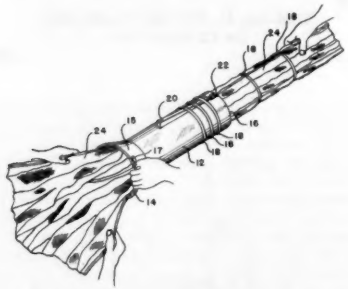
ners to a frame supported by spaced, surface-engaging transit members, disposed generally beneath the two lower corners of the sail and with the user position in a spaced relationship at right angles to the sail, which results in maximum capsize resistance of the apparatus.

3,831,540
CATAMARAN AND METHOD OF MAKING
John N. Case, 783 Cave St., Victoria, B.C., Canada
Filed Jan. 31, 1972, Ser. No. 221,943
Int. Cl. B63b *3/02*
U.S. Cl. 114—77 R **4 Claims**



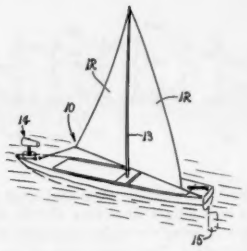
There is disclosed a method for converting conventional ships hulls into catamarans, comprising the longitudinal and vertical division of the hull into two halves. The two halves are then connected by a bridging member to define a deck, and the open inner sides of the two halves are completed to make them water-tight. In a preferred construction, to compensate for increased lightship weight and allow for greater capacity, a section is added to the centre of each of the longitudinal halves, thus increasing the length of the vessel. By this means, a hull that has marginal stability or is unstable or otherwise unsuitable for use can be given increased stability and carrying capacity and to take advantage of other unique features which catamarans possess. The result is a catamaran of much lower cost than a new ship.

3,831,541
DEVICE FOR APPLYING STOPS TO SPINNAKER SAILS
Robert D. Williams, Jr., Palisades, N.Y., assignor to Dwight S. Williams Co., New York, N.Y.
Filed May 30, 1973, Ser. No. 365,346
Int. Cl. B63b *9/04*
U.S. Cl. 114—104 **9 Claims**



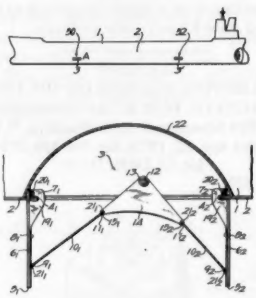
A device for applying "stops" to a spinnaker sail comprising a hollow tubular member through which the sail is passed. The sail is thereby compressed into a tight roll configuration and elastic bands positioned on the tubular member are slipped off of the tubular member and onto the sail as it exits from the member to maintain the sail in a tight roll configuration.

3,831,542
AUTOMATIC PILOT FOR SAILBOAT HAVING AN IMPROVED RUDDER CONTROL UNIT
David A. Krebs, Destin, Fla., assignor to Earle P. Thurston, Fresno, Calif.
Filed June 13, 1973, Ser. No. 369,713
Int. Cl. B63h *25/04*
U.S. Cl. 114—144 C **8 Claims**



An automatic pilot including a rudder control unit having a bidirectional electric motor for driving the rudder of a sailboat having motor input terminals, switching circuitry associated with the motor for controlling the supply of electrical power to the input terminals, and a device mounted on the sailboat, preferably a wind sock, which operates to sense wind direction, connected with the switching circuitry for dictating the condition of the circuitry in response to changes in wind direction, whereby the sailboat is automatically piloted as a function of wind direction.

3,831,543
DEVICE FOR CONTROLLING SEABORNE VESSELS
Kamenosuke Hamasaki, 3322 Kozasa Danchi, 432-1 Oaza Shemonagao, Fukuoka, Japan
Filed Jan. 6, 1972, Ser. No. 215,795
Claims priority, application Japan, Aug. 6, 1971, 46-59005
Int. Cl. B63h *25/44*
U.S. Cl. 114—145 R **11 Claims**



An apparatus for controlling the movement of a ship or similar water borne vessel, includes a pair of control plates which are mounted at longitudinally spaced locations on the vessel hull, preferably in a position in which they enclose a cavity containing the plate movement control mechanism. The plates are pivotally mounted at their outer or opposite ends to the hull, and when they are pivoted against the hull, they substantially can close a cavity in which is contained a rotatable element which is rotatable for the purposes of opening and closing the plates. The rotatable element comprises a shaft having a control plate, for example a triangularly-shaped

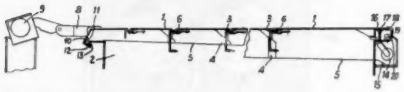
plate, with one of the apices centered on the rotatable shaft and opposite spaced apices which are connected through control rods to the respective plates. An alternate construction includes a separate rotatable shaft and a drive plate for each control plate and a central rotatable lever arm centrally located within the cavity and connected through connecting rods to each individual drive plate.

3,831,544

WATER-TIGHT CLOSING DEVICE

Rene Caillet, 26 Rue de la Republique 78, Saint-Germain-En-Laye, France

Filed Aug. 3, 1971, Ser. No. 168,543
Claims priority, application France, Aug. 5, 1970, 70.28847
Int. Cl. B63b *19/18*
U.S. Cl. 114—202 **9 Claims**



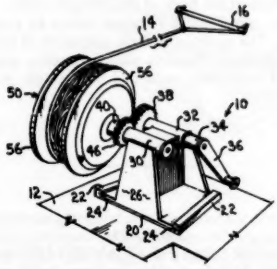
Device for automatically closing in a water-tight manner an aperture by means of a movable panel, characterized in that is comprises an inclined ramp on which the panel is caused to bear during its movement, the ramp being disposed along the longitudinal edges of the aperture so as to move away from the plane of the aperture when considering the ramp in the direction of travel of the panel during the closing movement thereof, so that during its closing movement, the panel moves towards the aperture and, at the end of this movement, eventually slides on suitable gasket means carried by the panel, along the edges of the aperture to be closed, and locking means disposed on the panel sides and adapted at the end of the closing movement to coact with corresponding locking means located externally of the aperture for automatically clamping the gaskets against the edges of the aperture.

3,831,545

WATER SKI TOWLINE PAY-OUT AND RETRIEVAL APPARATUS

Gerald E. Cain, Sublette, Kans. 67877

Filed May 16, 1973, Ser. No. 360,653
Int. Cl. B65h *75/40*
U.S. Cl. 114—235 WS **8 Claims**



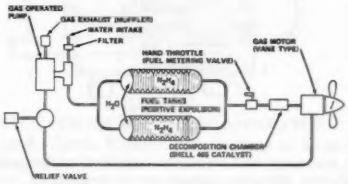
Apparatus assembled as a unit which is buoyant in water, rapidly secured and released from a boat, and capable of paying-out or retrieving an unloaded water ski towline. A hook on the hub of the wind spool receives an eyelet in the end of the towline for quick connection and release of the towline from the apparatus. The apparatus may be manually cranked to retrieve the towline into the boat, and has a free-wheel position wherein drag on the towline causes the latter to pay-out upon movement of the boat.

3,831,546

PORTABLE SWIMMER PROPULSION UNIT

Robert J. Geres, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 24, 1972, Ser. No. 237,814
Int. Cl. B63b *21/56*
U.S. Cl. 115—6.1 **1 Claim**



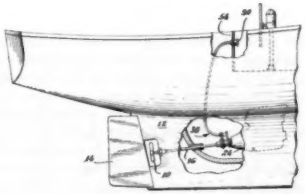
A portable swimmer propulsion unit including a vane type gas motor driving a shrouded screw. A positive expulsion, boot strap, hydrazine feed system supplies hydrazine to a hydrazine decomposition reactor. Gas from the reactor serves to drive the gas motor.

3,831,547

PROPELLER SHAFT LOCK

John Lee Bird, Upland Dr., Greenwich, Conn. 06830

Continuation of Ser. No. 96,053, Dec. 8, 1970, abandoned. This application Sept. 7, 1972, Ser. No. 286,675
Int. Cl. B63h *5/06*
U.S. Cl. 115—43 **4 Claims**

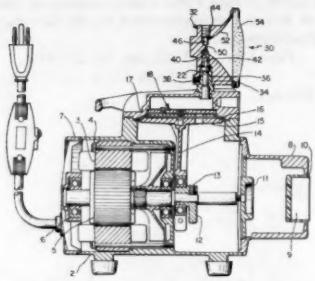


A propeller shaft lock for preventing rotation of windmilling of a boat propeller and controlling its position when its engine is "off" and its transmission is in neutral, comprises a cam mounted on the propeller shaft and having abrupt radial shoulders equal in number to the number of blades comprising the propeller, and a stop member which is movable into and away from the path of rotation of said shoulders. The means for controlling the position of the stop member may be manually controlled mechanical means, or automatic means controlled by the pressure of the oil of the lubricating system of the propeller shaft engine.

3,831,548
PEST CONTROL DEVICE

Arthur J. Droege, 2213 Broadway, Sheboygan, Wis. 53081

Filed Dec. 29, 1972, Ser. No. 319,448
Int. Cl. G08b 9/00
U.S. Cl. 116—22 A 15 Claims

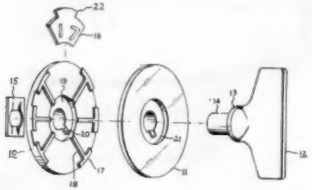


A resonator and resonator combination for continuously producing ultrasonic vibrations of frequencies effective to drive away pests, e.g., rodents. The resonator has a housing provided with an internal cavity and an outwardly flaring horn in communication with and spaced from said fluid jet producing means. A rigid airfoil, which may be integral with said housing, projects into the path of flow of fluid from the jet producing means to the jet obstruction means. The resonator can be used in combination with a means to continuously supply air under pressure to the jet producing means and characterized by cycle pulsation to cyclically vary the amplitude of the ultrasonic vibrations, said means preferably comprising an expansible chamber axially aligned with and closely connected with said jet producing means.

3,831,549
CHANNEL INDICATOR MEANS HAVING REPLACEABLE INDICIA

John M. Parsons, Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed July 19, 1971, Ser. No. 163,786
Int. Cl. H03j 1/02
U.S. Cl. 116—124.1 3 Claims

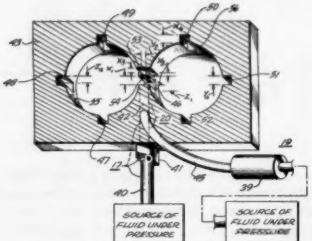


A partitioned indicia carrier having a flange or ridge about the periphery thereof is mated with a transparent cover whose rear surface approaches the peripheral flange. A knob having a shank extending therefrom engages the cover and indicia carrier such that they rotate with the knob. Thin, resilient indicia are deformably inserted between the retaining and the cover disc. New indicia may be inserted in front of existing ones, or existing indicia may be removed by flexing the cover away from the carrier to enlarge the gap between the rear of the cover disc and the peripheral ridge of the retainer disc.

3,831,550
SONIC WAVE GENERATION

Nathaniel Hughes, Rolling Hills Estates, Calif., assignor to Energy Sciences Incorporated, El Segundo, Calif.

Continuation-in-part of Ser. No. 85,911, Nov. 2, 1970, abandoned, which is a continuation-in-part of Ser. No. 827,451, April 23, 1969, Pat. No. 3,554,443, and a continuation-in-part of Ser. No. 82,771, Oct. 21, 1970, abandoned, and a continuation-in-part of Ser. No. 158,915, July 1, 1971, Pat. No. 3,730,160. This application Oct. 14, 1971, Ser. No. 189,206
Int. Cl. B06b 3/00
U.S. Cl. 116—137 A 56 Claims



In a first embodiment, a source of fluid under pressure is supplied to a conduit that is terminated by a transverse resonant cavity preferably having a square cross section. The cross section of the conduit and the cavity are dimensionally related. In a second embodiment, a shock wave generator is coupled to a transverse resonant cavity. The component wavelengths of the shock waves and the cross-section of the cavity are dimensionally related. A third embodiment combines the first and second embodiments. The primary resonant cavity itself may be supplemented by auxiliary resonant cavities that communicate with a partially enclosed area into which the primary resonant cavity opens. One or more of the auxiliary cavities may be fed in parallel with the primary cavity by auxiliary conduits. Further, an auxiliary cavity may be arranged in series with the primary cavity to form a fluidic reflecting surface at the back of the primary cavity. Fluid may be supplied to a transverse resonant cavity by two or more feed conduits. The cavity may form a network of closed interconnected geometric channels such as circles, squares, and triangles, that are either arranged in a single plane or in stacked planes.

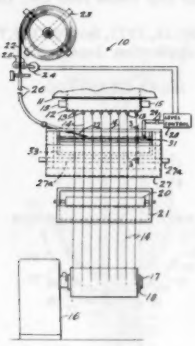
3,831,551
APPARATUS FOR COATING FILAMENTARY MATERIAL

Roger A. Kime, Napoleon, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 14, 1972, Ser. No. 244,182
Int. Cl. B05c 11/10
U.S. Cl. 118—7 9 Claims

Method and apparatus for coating fibers of glass and the like with a liquid such as molten aluminum. The fibers are passed through a lip of the molten metal which projects from an upper edge of a vessel which holds a body of the molten

metal. The coated fibers are then passed over a heated wiper to more uniformly distribute the molten metal on the fibers



before the metal hardens. An automatic control is provided for maintaining a substantially constant molten metal level in the vessel as the metal is applied to the fibers.

3,831,552

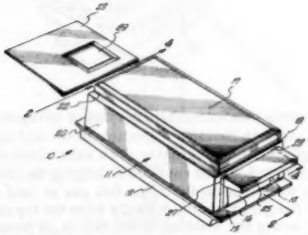
FINGERPRINTING APPARATUS

Gerald W. Schmidt, Woodland Hills; Jay Smith, III; Lawrence T. Jones, both of Pacific Palisades, and Richard F. M. Conroy, Woodland Hills, all of Calif., assignors to Identicator Corporation, San Francisco, Calif.

Filed Feb. 7, 1972, Ser. No. 224,025

Int. Cl. B05b *17/00*

U.S. Cl. 118—31.5 **26 Claims**



A fingerprinting apparatus is disclosed for developing latent fingerprints impressed on the surface of a medium, such as a check. The apparatus comprises a casing having an enclosed cavity formed therein for containing a supply of magnetizable powder. A slot is formed in the upper portion of the casing defining an opening over the cavity. A spring biased cover is mounted over the opening to enclose the cavity and prevent the powder from spilling out during non-use. A folded holder is adapted to receive the medium within the fold. The bottom fold of the holder has an open window formed thereon for displaying the latent fingerprint on the medium. The holder is adapted to be inserted within the slot and under the cover, and is positioned to expose the window directly over the opening of the cavity. A magnet is rotatably mounted within the cavity and includes at least one pole which is adapted to physically contact the powder for attracting a quantity of powder thereon. The pole of the magnet is then rotated upwardly to pass over the opening of the cavity to brush a portion of the powder onto the surface of the medium. A portion of the powder deposited on the magnet adheres to the oils defining the latent fingerprint, but not to portions of the surface devoid of such oils, to produce a visible image of the fingerprint. The magnet is rotated by a gear and arcuate rack drive combination. The arcuate rack is formed on a lever which is pivotally mounted on the sidewall of the casing. A hammer is also pivotally mounted on the sidewall of the casing and is adapted to be cocked and triggered by the lever to strike the holder to shake loose any excess powder deposited on the impressed fingerprint.

3,831,553

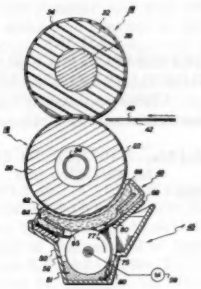
WICK FOR OIL DISPENSING APPARATUS

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 11, 1972, Ser. No. 313,719

Int. Cl. B05c *11/00*

U.S. Cl. 118—266 **2 Claims**



Apparatus for lubricating the heated fuser roll in a heated pressure xerographic fusing system. The apparatus includes an applicator roll for providing a film of oil to a wick assembly having a main wick contacting the fuser roll and an auxiliary wick contacting the applicator roll and the main wick at one end and an oil supply at the other end to dispense sufficient oil when the applicator roll is inoperative. The improvement is in the form of a sponge member inserted between the main wick, auxiliary wick, and applicator roll to limit the flow of oil onto the main wick thereby preventing oversaturation thereof.

3,831,554

SPECIMEN AGITATOR

Henry T. Wilton, Buffalo, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

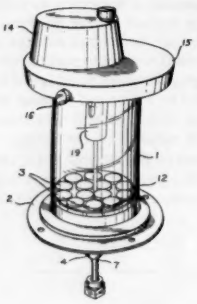
Filed June 27, 1973, Ser. No. 374,182

Int. Cl. B05c *3/08*

U.S. Cl. 118—416 **10 Claims**

A motor driven agitator providing slow rotational movement of a specimen holder rack with momentary periodic mo-

tion in the direction of the rotational axis induces maximum penetration of a treating fluid into specimens held in porous capsules on the rack. A self-aligning, automatic engaging



clutch arrangement permits the agitator cover with motor, to be conveniently removed and replaced without complex mechanical components or annoying delays caused by unsuccessful efforts to align separated driving and driven members.

3,831,555

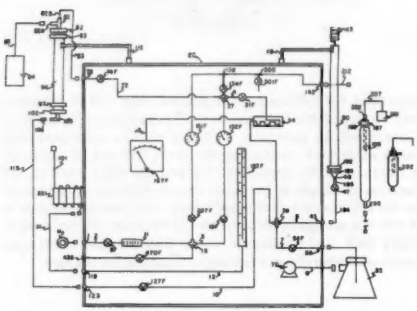
SYSTEM FOR PREPARING PACKED COLUMNS AND COATED CAPILLARY TUBES USEFUL IN GAS CHROMATOGRAPHY

Srivas Rangachar Srinivas, 2850 Webb Ave., Apt. 5J, Bronx, N.Y. 10468

Filed Mar. 7, 1972, Ser. No. 232,583

Int. Cl. C23c *13/08*

U.S. Cl. 118—506 **11 Claims**



An integral system contained in a suitable housing which includes means for coating particulate support material with stationary phase chemicals, means for draining liquid from the coated support material, means for drying the coated support material, and means for transferring the dried, coated support material into a gas-chromatography column. Means for cleaning and coating capillary tubes is also disclosed. Additionally means for conditioning packed columns and capillary tubes is disclosed.

3,831,556

LIQUID DEVELOPING APPARATUS OF ELECTROSTATIC LATENT IMAGE

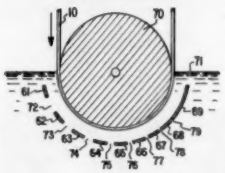
Masamichi Sato, and Osamu Fukushima, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 16, 1971, Ser. No. 124,778

Claims priority, application Japan, Mar. 16, 1970, 45-22179

Int. Cl. G03g *13/00*

U.S. Cl. 118—637 **8 Claims**



A liquid developing apparatus for electrostatic latent images, the apparatus including a developing electrode having open areas where the ratio of open areas to non-open areas decreases along the path of the electrophotographic material.

3,831,557

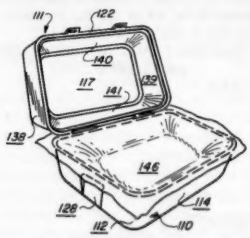
CAT LITTER BOX

James N. Elesh, 40 Sportsman's Hill Rd., Madison, Conn. 06443

Continuation-in-part of Ser. No. 218,295, Jan. 17, 1972, abandoned. This application Jan. 24, 1973, Ser. No. 326,244

Int. Cl. A01k *01/00*

U.S. Cl. 119—1 **6 Claims**



A one-piece molded sanitary cat box of hexagonal-like vertical cross section having a disposable linear and an integrally hinged splatter shielding cover with sides slanted upwardly and inwardly to keep the cat from dislodging the filler material and daily waste outwardly of the box per se, and containing deflector flanges extending inwardly from the top edges of the shield to return the material in the box away from the inner edges thereof, the box and cover containing a mating joint to anchor a free end of a disposable liner for the box and arranged to prevent the filler material and daily waste from entering the joint.

3,831,558

WATER FOUNTAIN FOR ANIMALS

Alden O. Forbes, Colorado Springs, Colo., assignor to North 40 Manufacturing Inc., Colorado Springs, Colo.

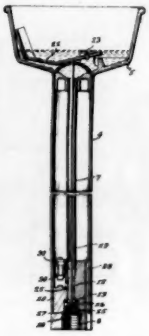
Filed Aug. 16, 1973, Ser. No. 388,818

Int. Cl. A01k *7/00*

U.S. Cl. 119—73 **1 Claim**

An animal watering fountain having a water containing basin supported by a stanchion imbedded in the earth for sup-

port and containing the water conduit which is connected to a water source, and including intake and drain valves, the



former of which is operated by an animal which depresses a valve actuator lever disposed within the water basin.

3,831,559

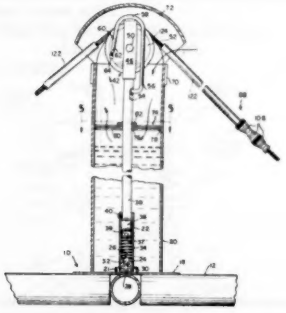
STOCK TREATMENT DEVICE

Bert F. Hinrichs, 926 N. Hampton Blvd., Shelbyville, Ind. 46176

Filed Aug. 24, 1972, Ser. No. 283,493

Int. Cl. A01k *29/00*

U.S. Cl. 119—157 **11 Claims**



A stock treatment device which provides a comb-strung flexible strand suspended so that a domestic animal may conveniently rub its hide against the strand. The strand is so suspended that when an animal does so rub itself, a pump will be actuated to deliver treatment liquid to an elevated region of the strand so that the liquid will saturate the strand and rub off onto the animal's hide. A face treater is associated with the strand and pump to attract animals to the assembly and includes an improved box for containing salt or other bait. The combs on the strand are of novel construction to assist in distributing the liquid which is delivered to the strand.

3,831,560

COIL-TYPE CONTINUOUS FLOW HEATER

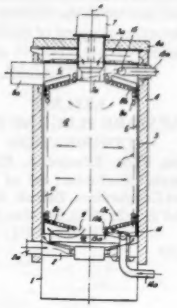
Hans L. Kuhnlein, Fullinsdorf, Switzerland, assignor to Hch. Bertrans Aktiengesellschaft

Filed May 10, 1973, Ser. No. 358,999

Claims priority, application Switzerland, Sept. 21, 1972, 13904/72

Int. Cl. F22b *27/08*

U.S. Cl. 122—250 R **6 Claims**



A coil-type continuous flow heater which comprises a combustion chamber, burner means located at one end of the combustion chamber and flue gas outlet means disposed at the other end of said chamber, and pipe coil means substantially lining the combustion chamber, said pipe coil means being coaxially disposed within said chamber so that no gaps exist between the individual coils of said pipe, said pipe coil means also extending a distance from the wall of the combustion chamber so as to define a flue gas duct which is adapted to channel the flue gas from the flue gas outlet means to an outlet means at the burner side of the combustion chamber.

3,831,561

DEVICE FOR EARLY DETECTION OF RUPTUKE OF THE PRESSURE PART OF A BOILER

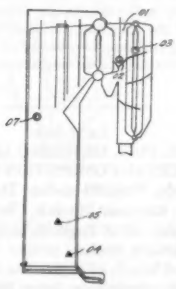
Takashi Yamamoto, Togitsu-machi; Kenichi Yasukouchi, and Ryuichi Sato, both of Nagasaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 14, 1973, Ser. No. 397,355

Claims priority, application Japan, Sept. 25, 1972, 47-95907

Int. Cl. F22b *37/48*

U.S. Cl. 122—379 **8 Claims**



A device for early detecting any abnormal conditions of a boiler from the sound wave which is generated when water or steam spouts from the pressure part of the boiler. The device

is adapted for use in an atmosphere, such as a recovery boiler, which is liable to contamination, and comprises a gate circuit for shutting a sound wave transmission tube and shutting an output of a microphone upon actuation of soot blowers of the boiler so as to protect the device against detrimental effects imposed thereon by the operation of the soot blowers, means for cleaning the transmission tube by passing pressurized air therein while the output of the microphone is being shut down, means for cooling the sound wave transmission tube, means for detecting an abnormal condition of the microphone by passing pressurized air in the vicinity of said microphone and means for detecting clogging of the sound wave transmission tube by pressure.

3,831,562

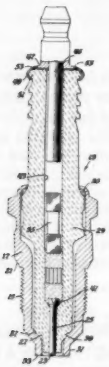
SURFACE GAP SPARK PLUG AND ROTARY ENGINE COMBINATION

Wayne E. Paxton, Flint; Edward A. Rishavy, Warren, and James H. Currie, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 2, 1973, Ser. No. 375,369

Int. Cl. F02b *53/12*

U.S. Cl. 123—8.09 **3 Claims**



A surface gap type spark plug in combination with a rotary engine having an ignition opening in the housing inner surface, the opening being substantially entirely closed off by the firing end of the plug to substantially eliminate any blow-by or leakage gas as the apex seal wipes over the opening area, the reach of the plug being precisely controlled to place the sparking surface of the plug at the housing inner surface with the spark substantially in the combustion chamber while precluding projection of the plug into the combustion space beyond the inner housing surface, the closing of the ignition opening at the housing inner surface serving also to preclude collection of lubricant.

3,831,563

ELECTRONIC FUEL METERING APPARATUS FOR INTERNAL COMBUSTION ENGINE

William J. Brittain, Westcliff-on-Sea; Thomas J. L. Dobedoe, Wateringbury; Raymond Mitchell, Chelmsford, and Wilfred T. Oliver, Rugby, all of England, assignors to Ford Motor Company, Dearborn, Mich.

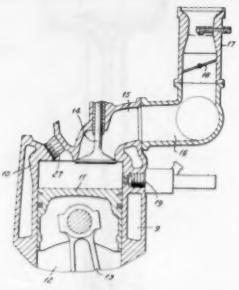
Filed Nov. 3, 1972, Ser. No. 303,661

Claims priority, application Great Britain, Feb. 3, 1972, 5056/72

Int. Cl. F02m *51/00*

U.S. Cl. 123—32 EA **1 Claim**

Electronic fuel metering apparatus is described for use with an internal combustion engine having an air inlet passage for supplying air to one or more combustion chambers. The apparatus includes an electrically controlled fuel metering device, a circuit for accumulating a count of air entering the combustion chamber (s), and a circuit for controlling, in accordance with the air count, the amount of fuel discharged by the fuel metering device. An up/down counter may be employed, and the rate at which fuel is discharged may be varied depending upon the air count accumulated on the up/down counter.



3,831,564

METHOD TO REDUCE NOXIOUS COMPONENTS IN INTERNAL COMBUSTION ENGINE EXHAUST GASES, AND APPARATUS THEREFOR

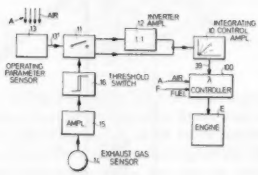
Peter Schmidt, Schwieberdingen, and Osvaldo Bejerman, Gerlingen, both of Germany, assignors to Robert Bosch GmbH, Gerlingen-Schillerhohe, Germany

Filed Dec. 14, 1972, Ser. No. 314,922

Claims priority, application Germany, June 20, 1972, 2229928

Int. Cl. F02m *7/00, 51/00*

U.S. Cl. 123—22 EA **12 Claims**



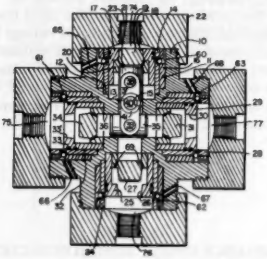
The composition of exhaust gases is sensed and an electrical signal is derived representative of the composition, which has at least two discrete values. A control signal is generated, the control signal continuously varying in increasing or decreasing direction, for example by utilizing an integrator, and the control signal is applied to control the mass ratio of air and fuel applied to the engine. The direction of variation is controlled in dependence on the discrete value of the control signal. An operating parameter signal of the engine is also generated, and the rate of variation of the continuously varying control signal is changed as a function of the operating parameter signal; the controller typically is an integrating-type controller, in which the integrating rate is changed, as commanded by an engine operating parameter which may, for example, be the flow rate of air being applied to the engine.

3,831,565

ENGINE

Hillard M. Avery, R.R. 3, Box 140A, Morgantown, Ind. 46160

Filed Sept. 10, 1973, Ser. No. 395,954
Int. Cl. F01l *11/00*; F02b *75/22*
U.S. Cl. 123—47 AA 6 Claims



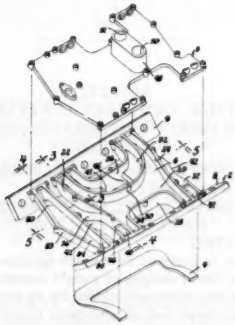
An internal combustion engine comprising a block providing four equiangularly arranged cylinders opening toward a common center, a piston reciprocable in each cylinder, each piston comprising a main body formed at its outer end with an outwardly tapering port, and a plug for closing the tapered port at times, a first drive piston reciprocable across the common center and cooperative with one diametrically opposed pair of plugs, a second drive piston reciprocable across the common center and cooperative with the other diametrically opposed pair of plugs, a link connected at one end to the first drive piston and connected at its other end to the second drive piston, a rotor mounted on an axis which is perpendicular to the plane which is common to the axes of the cylinders, and a pivot connecting the midportion of the link eccentrically to the rotor to drive the rotor when the drive pistons are reciprocated in sequence.

3,831,566

MULTI-PIECE INTAKE MANIFOLD

Thomas G. Thomas, Bedford, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 31, 1973, Ser. No. 365,546
Int. Cl. F02b *29/00*
U.S. Cl. 123—52 MV 5 Claims



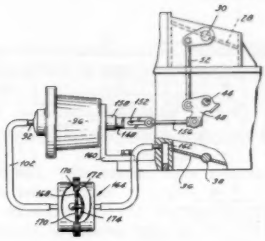
A multi-piece bi-level engine intake manifold comprises a main body, a top cover member and a bottom cover member. The main body has a pair of upwardly opening channels and a downwardly opening channel in communication with discharge ports, the downwardly opening channel being in communication through an opening in the level portion of the manifold with one of the upwardly opening channels. The upwardly opening channels are closed at their upper surfaces by the top cover member, and the downwardly opening channel is closed at its lower surfaces by the bottom cover member.

3,831,567

SUPPLEMENTAL PULLDOWN MECHANISM FOR CARBURETOR AUTOMATIC CHOKE

Richard J. Freismuth, Mt. Clemens, and Thomas R. Johnson, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 16, 1973, Ser. No. 389,066
Int. Cl. F02m *1/10*
U.S. Cl. 123—119 F 7 Claims



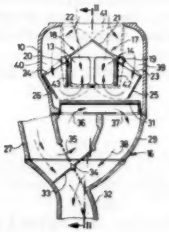
The carburetor has a conventional automatic choke construction heating a bimetallic coil by engine exhaust stove heat to slowly open the choke valve during cold weather starts; a supplemental temperature responsive power means operable above a predetermined ambient temperature in response to engine acceleration demand moves the choke valve open faster, to reduce emissions.

3,831,568

INTERNAL COMBUSTION ENGINE FUEL-AIR MIXTURE PREHEATING APPARATUS

Fritz Heimburg, Russelsheim, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1973, Ser. No. 355,692
Claims priority, application Germany, May 15, 1972, 2223655
Int. Cl. F02m *31/00*
U.S. Cl. 123—122 R 6 Claims



A preheater for the fuel-air mixture of an internal combustion engine has a housing one end wall of which is closed by one side of a heat exchanger, an opposite end wall having an inlet, and a side wall having an outlet, for the mixture which can be selectively preheated by the operation of a pair of butterfly valves pivotally mounted between the inlet and the heat exchanger and to each side of the outlet, the vanes of the valve in one position (preheating) forming a guide baffle which

directs the mixture into contact with the heat exchanger before reaching the outlet and in another position (no preheating) forming a trough shaped guide baffle by which the mixture is caused to flow directly from the inlet to the outlet of the housing.

3,831,569

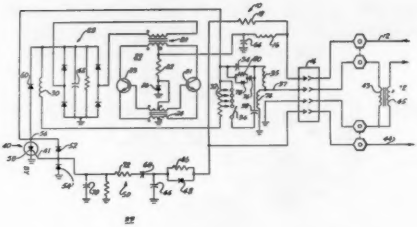
CAPACITIVE DISCHARGE IGNITION SYSTEM HAVING PROTECTIVE DIODE NETWORK

Christopher A. Jacobs, 3570½ Eagle Rock Blvd., Los Angeles, Calif. 90065

Continuation-in-part of Ser. No. 866,626, Oct. 15, 1969, Pat. No. 3,716,037. This application Nov. 29, 1972, Ser. No. 310,266

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 CD **4 Claims**



An ignition system for internal combustion engines utilizing a capacitive discharge to supply energy to the spark plugs. Charging and discharging of the capacitor is controlled by a circuit utilizing a silicon controlled rectifier (SCR) which operates in response to the engine controlled switching means for turning on and in response to positive back-biasing for turning off. A diode network is provided and is electrically connected to the SCR in such a way that it performs multiple functions, including providing a path for channeling coil-capacitor oscillating energy in the system back to the energy storage capacitor, biasing the electrodes of the SCR in proper relation to one another to provide proper control of the potentials on the SCR electrodes to assure extinguishment of the SCR and aiding the system in preventing the buildup of residual magnetism in the ignition coil by providing a reverse direction current path in parallel with the SCR.

3,831,570

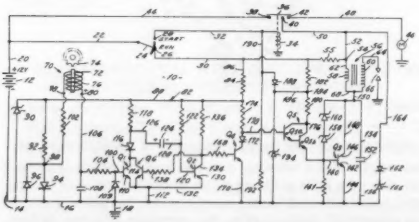
BREAKERLESS IGNITION SYSTEM

Carlton B. Compton, Detroit, and Walter L. Doelp, Jr., Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1972, Ser. No. 316,944

Int. Cl. F02p *3/02*

U.S. Cl. 123—148 E **2 Claims**



A breakerless ignition system for a spark ignition internal combustion engine is described. The system utilizes an alternating signal having a frequency proportional to the rate at which sparks are to be generated. The alternating signal is applied to the control electrode of a first transistor. The control electrode normally is biased to a point close to conduction. A second transistor has its control electrode connected to one side of a capacitor, the other side of which is connected to the output of the first transistor. A third transistor has its output circuit coupled to the primary of an ignition coil. Means are provided for coupling the output circuit of the second transistor to the control electrode of the third transistor. The circuitry of the third transistor operates at voltage levels determined by the source of electrical energy utilized, such as a storage battery or alternator. The first and second transistors operate at a reduced voltage level determined by a circuit comprising a resistor and a zener diode. Transient protection is provided throughout.

3,831,571

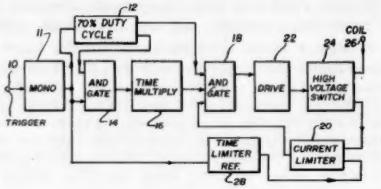
VARIABLE DWELL IGNITION SYSTEM

Howard F. Weber, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed May 11, 1973, Ser. No. 359,472

Int. Cl. F02p *1/00*

U.S. Cl. 123—148 E **6 Claims**



An electronic triggering circuit for an ignition system develops electric signals which correspond to the closing and opening of breaker points to supply variable dwell (ratio of on-to-off) pulses to the primary winding of the ignition coil at speeds below a predetermined RPM. The circuit operates to supply constant dwell pulses to the primary winding of the ingition coil at higher engine speeds.

3,831,572

SINGLE-STAGE COLD START AND EVAPORATIVE CONTROL METHOD AND APPARATUS FOR CARRYING OUT SAME

Sigmund M. Csicsery, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

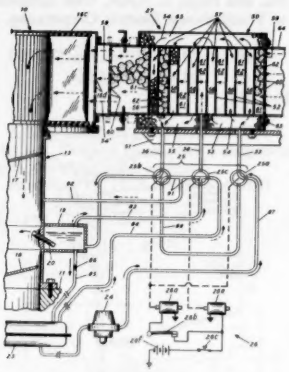
Filed Oct. 4, 1972, Ser. No. 295,028

Int. Cl. F02m *1/16, 27/02*

U.S. Cl. 123—179 G **10 Claims**

As cold start is initiated in a spark-ignition internal combustion engine, lower molecular weight constituents of a full-range gasoline are selectively eluted by an elution system including an adsorbent bed of adsorbent material. The adsorbent bed forms an elution zone within a cannister assembly in fluid contact with the full range gasoline. The adsorbent material—usually in pelletized form—is preferably housed within a tubular means disposed within the cannister assembly, the tubular means being positioned within a much larger shell housing in fluid contact with a valve and conduit network. Entry of the gasoline is initiated by the valve and

conduit network under control of a controller circuit. A vapor emission control system can also be housed within the



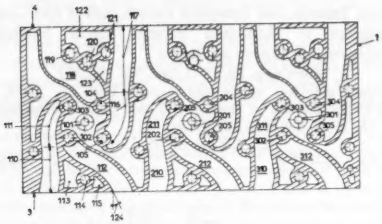
cannister assembly and undergo selective operation to prevent escape of vapor emission originating from within the carburetor and gasoline tank.

3,831,573

CYLINDER HEAD FOR AN INTERNAL COMBUSTION ENGINE

Jean Excoffon, Villeurbanne, France, assignor to Automobiles M. Berliet, Lyon, France

Filed Mar. 27, 1972, Ser. No. 238,225
Int. Cl. F02f *1/42*
U.S. Cl. 123—193 H **6 Claims**



A cylinder head, particularly adapted for a diesel engine including four valves, two inlet and two exhaust, symmetrically arranged about an injector. Each of the inlet valves has associated therewith an inlet duct opening to a first lateral face of the head. The exhaust ducts associated with the exhaust valves open on the opposite lateral face of the head. The inlet ducts are configured such that a turbulence is created in each one in the same direction around the injector seating.

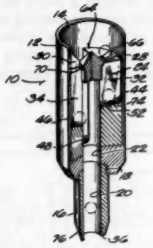
3,831,574

LOADING DEVICE FOR SPHERICAL OBJECTS

Leif W. Strand, Rt. 1, Walworth, Wis. 53184

Filed Jan. 24, 1973, Ser. No. 326,226
Int. Cl. F41c *25/00*
U.S. Cl. 124—49 **8 Claims**

A loading device for loading spherical air rifle shot into the magazine of an air rifle includes an inlet chamber having a central passage and a plurality of radially positioned channels whose bottoms are axially staggered. The channel bottoms slope to the central passage which in turn delivers the shot to the discharge passage. In the inlet chamber and along the lon-



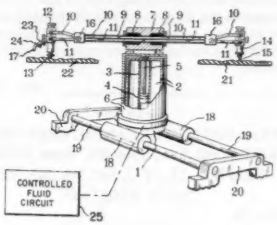
gitudinal axis of the device a cone shaped member is positioned so as to deflect the shots into the channels.

3,831,575

APPARATUS FOR REPRODUCING RELIEF IMAGES ON SOLID BODIES

Angelo Menghini, Villa d'Alme, Italy, assignor to Giacomo Cortinovis, Boldone, Italy

Filed Oct. 16, 1972, Ser. No. 297,771
Claims priority, application Italy, Oct. 22, 1971, 2947/71
Int. Cl. B28d *1/26;* **B44b** *1/02*
U.S. Cl. 125—7 **7 Claims**



Semi-automatic apparatus for reproducing relief images on blocks or slabs of marble, granite and the like, comprising a sensing member and a power driven working tool, as rotably interconnected about two axes at right angles to each other, said sensing member and working tool being movable along a longitudinal axis and rotable about an axis at right angles to said longitudinal axis, as carried by a head which through a piston-cylinder assembly can be raised or lowered relative to a bearing base.

3,831,576

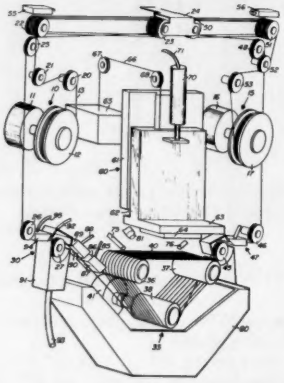
MACHINE AND METHOD FOR CUTTING BRITTLE MATERIALS USING A RECIPROCATING CUTTING WIRE

Harold W. Mech, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 200,943, Nov. 22, 1971, abandoned.
This application July 9, 1973, Ser. No. 377,672
Int. Cl. B28d *1/08*
U.S. Cl. 125—12 **10 Claims**

A web of wires defining a cutting area having a plurality of axially spaced apart wire portions formed by winding a continuous strand of wire around a plurality of elongated spaced apart pulleys, said continuous strand extending from a source of new wire and extending to take-up means. One of said elongated pulleys having a reversible motor attached thereto for

causing the wire in the cutting area to continually move and periodically reverse directions. Mounting apparatus external of said web for fixedly holding a piece of material to be cut and moving the material into the cutting area in engagement with the wires therein at a generally uniform rate. Apparatus for supplying a continuous flow of cutting mixture, including relatively fine particles of cutting material and a relatively



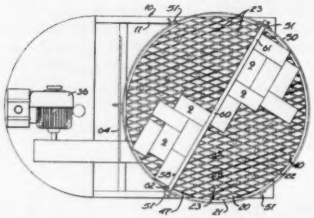
viscous carrying agent, to the cutting area and further apparatus for removing the cutting mixture from the wire as it leaves the cutting area, including a jet of gas directed onto the wire transverse to the longitudinal axis thereof, a bath for immersing the wire in a relatively low viscous fluid and a second jet of air directed onto the wire for removing the relatively low viscous mixture.

3,831,577

APPARATUS FOR CLEANING USED BRICKS

Rex Price, 6310 E. 6th Ave., Spokane, Wash. 99206

Filed Nov. 13, 1972, Ser. No. 305,705
Int. Cl. B28d *1/00*
U.S. Cl. 125—26 **5 Claims**



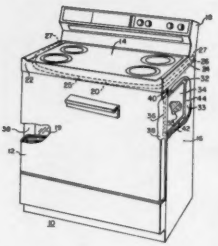
An apparatus is described for cleaning the mortar and other protruding material from the surfaces of used building bricks. The apparatus has a perforate turntable with an expanded sheet metal lath removably supported thereon and substantially covering the turntable. The expanded sheet metal provides edges upon which the bricks are supported, so that these upstanding edges scrape the protruding material from the brick surfaces. An upstanding band surrounds the brick on the turntable to keep the bricks thereon and a stationary bar across the band keeps the bricks from traveling with the sheet metal lath.

3,831,578

RANGE EXTERIOR SURFACE COOLING DEVICE

Robert Draper, Pittsburgh; Donald T. Beecher, Murrysville, both of Pa., and David L. Ayers, West Lafayette, Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 11, 1973, Ser. No. 378,290
Int. Cl. A21b *1/00*
U.S. Cl. 126—19 R **10 Claims**



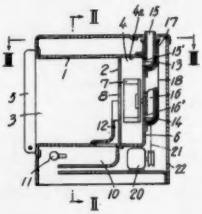
A sealed tube containing a heat transport fluid is positioned in heat exchange relation with those exterior surfaces of a pyrolytic self-cleaning oven which are raised to relatively high temperatures during the heat cleaning cycle. The heat transport fluid boils and the vapor is directed by the tube away from the hot exterior surfaces and is placed in heat exchange relation with other parts of the range which are at relatively cooler temperatures and can therefore be used as a heat sink. At these cooler locations, condensation of the transport fluid occurs and thereby removes the latent heat of vaporization of the fluid from the hot surfaces.

3,831,579

FORCED HOT AIR TYPE COOKING OVEN

Kazumi Tamada, and Tadayoshi Takase, both of Aichi, Japan, assignors to Kabushiki Kaisha Rinnai Seisakusho, Nakagawa-ku, Nagoya-shi, Japan

Filed Aug. 16, 1971, Ser. No. 172,081
Claims priority, application Japan, Dec. 16, 1970, 45-125294The portion of the term of this patent subsequent to Jan. 16, 1990, has been disclaimed.
Int. Cl. F24c *15/16, 15/32*
U.S. Cl. 126—21 A **6 Claims**



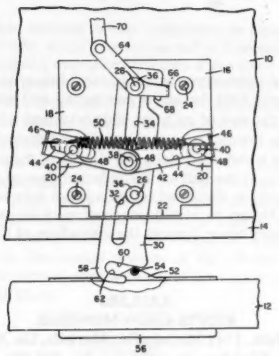
A hot air type cooking oven in which the interior of a casing is divided by a partition plate which has an opening at its center portion. The plate divides the casing into a front heating chamber and a rear blower chamber while providing lateral air passages on both sides of the plate. A combustion chamber is provided below the casing and contains a burner, the combustion chamber being in communication with the heating chamber through a communication duct which opens at the front lower portion of the opening. A blower is mounted

within the blower chamber to face the opening, and at least one exhaust opening is made in the rear wall of the casing and leads to an exhaust pipe extending upwards, an inner tube being removably and slidably mounted in the exhaust pipe.

3,831,580
LOCKABLE OVEN DOOR LATCH

Byron R. McLean, Coopers Plains, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Nov. 19, 1973, Ser. No. 417,105
Int. Cl. F24c *15/02*
U.S. Cl. 126—197 **10 Claims**



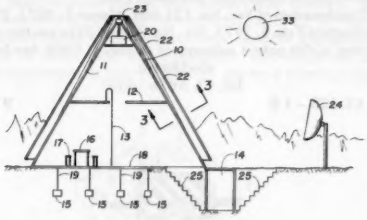
A mechanical latch mechanism, positioned adjacent the front wall of an oven, is provided with a latch arm having an outer end for engaging a roller on the oven door as the door is moved toward a closed position. The roller initiates an inward or backward movement of the latch arm and the arm is cammed during its backward travel from a canted or skewed position to a position substantially perpendicular to a vertical plane passing through the oven door, so as to facilitate the engagement of the door roller with a hook portion on the forward end of the latch arm. A pair of spring-loaded pivot arms, which initially function to retain the latch arm in its forward position, provide a rearward force to the latch arm after being pivoted passed dead center to urge the latch arm toward its backward most position and thereby retain the oven door in a closed and sealed position. The latch arm is also provided with a locking recess for operatively receiving a flanged end of a pivotal locking arm, which prevents the latch arm from moving forward and thereby locks the oven door in a closed and sealed position.

3,831,581
LUNAR SHELTER

Edward Baseley, Vancouver, B. C., Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 16, 1973, Ser. No. 342,027
Int. Cl. F24j *3/02*
U.S. Cl. 126—270 **2 Claims**

A lunar shelter which is maintained at a uniform temperature during the lunar day, by means of reflecting shutters about the outside of the shelter with the temperature of the shelter itself controlled by rotation of the external shutters.

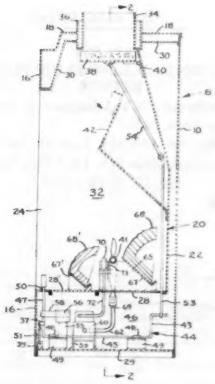


The shutters may be varied in projected width so as to vary the opening between the shutters to permit the desired amount of radiation from the sun to warm the shelter walls.

3,831,582
FIREPLACE HAVING A DAMPER-FUEL GAS SUPPLY INTERLOCK

Kenneth L. Mahoney, Fort Wayne, Ind., assignor to American Standard Inc., New York, N.Y.

Filed July 12, 1972, Ser. No. 270,907
Int. Cl. F23l *11/02*
U.S. Cl. 126—286 **24 Claims**



A fireplace having a gas-fired burner extending substantially the entire transverse dimension of the firebox for producing an elongated flame zone in the space between two artificial logs. The fuel supply control means for the burner is located in a control compartment below the bottom wall of the firebox to minimize the overall width of the fireplace. Preferably the fuel supply control means is interlocked with the flue damper so that fuel gas can be delivered to the burner only when the damper is in its fully open position.

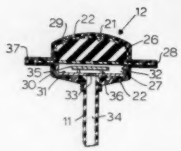
3,831,583
IMPLANTABLE BULB FOR INFLATION OF SURGICAL IMPLEMENTS

Louis Henry Edmunds, Jr., Piedmont, Calif., and Silas A. Braley, Midland, Mich., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 121,406, March 5, 1971. This application Feb. 5, 1973, Ser. No. 329,643The portion of the term of this patent subsequent to May 1, 1990, has been disclaimed.

Int. Cl. A61b *19/00*

U.S. Cl. 128—1 R **9 Claim**



A device, completely implantable within the human body, for restricting the flow of blood through a major blood vessel, such as an artery, especially the pulmonary artery. An inflatable, flexible annulus, generally circular in shape but not a closed circle, has a non-distensible outer wall so that upon inflation all distension or expansion is inward. The device is placed around an artery or other blood vessel, and the ring may then be closed, as by suturing together preformed tabs attached to the annulus, or by suturing together the ends of an overlapping tape, for instance, to firmly hold the vessel. Upon inflation, inward distension of the inflatable annulus constricts the vessel, and flow of blood therethrough is accordingly restricted. Inflation and deflation are effected through a self-sealing hollow bulb and a non-distensible tube connecting the bulb to the interior of the inflatable annulus, pressure fluid being introduced into the bulb by a fine hypodermic needle. The device may be wholly contained within the patient's body, and all surfaces thereof are of a substance, such as a medical elastomer, that is compatible with and resistant to the action of body fluids.

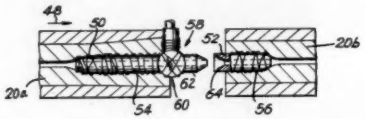
3,831,584
DEVICES FOR CONTROLLING FLUID FLOW IN LIVING BEINGS

Louis Bucalo, Holbrook, N.Y., assignor to Investors in Ventures, Inc., New York, N.Y.

Division of Ser. No. 155,141, June 21, 1971, Pat. No. 3,742,933. This application Feb. 14, 1973, Ser. No. 332,554

Int. Cl. A61b *19/00*

U.S. Cl. 128—1 R **4 Claims**



A device for controlling the flow of fluid in a living creature. The device has an inlet and outlet both of which are mounted fluid-tightly in a body cavity in a body compelling the fluid which is to be controlled to flow into said inlet before reaching the outlet. Between the inlet and outlet there is a control structure which in one position provides for flow of fluid in a given condition through the inlet and the outlet and which in another position prevents the flow of fluid in this given condition through the inlet and outlet. This control structure can provide for fluid flow at all times while chemically treating the fluid to prevent it from having a given condition, or the control structure can in one position cut off the flow of fluid and in another position reestablish the flow of fluid.

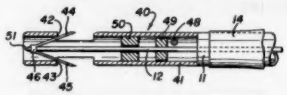
3,831,585
RETROGRADE RENAL BIOPSY DEVICE

Thomas L. Brondy, 334 A Joan Ct., Bartlett, Ill. 60103, and Andrew T. Cole, 5107 S. Blackstone, Chicago, Ill. 60615

Filed July 19, 1972, Ser. No. 273,016

Int. Cl. A61b *10/00*

U.S. Cl. 128—2 B **9 Claims**



A medical instrument for use in renal biopsy is in the form of an injector tube having a puncturing and scraping tool secured to the end of an inner slide wire and a balloon surrounding the injector tube at the distal end thereof. A second flexible tube is mounted along the outside of the injector tube and connects to the balloon for inflation thereof in the renal pelvis to hold the distal end of the injector tube in fixed relation to the kidney to permit penetration of the scraping tool into the kidney tissue through the epithelium of the renal pelvis.

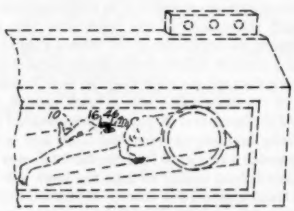
3,831,586
RESPIRATION MONITOR

Parker H. Petit, 1741 McCoba Dr., Marietta, Ga. 30080

Filed Nov. 16, 1972, Ser. No. 307,091

Int. Cl. A61b *5/02*

U.S. Cl. 128—2 R **9 Claims**

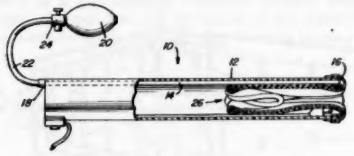


A respiration monitor comprising a sensing unit which senses the expansion and contraction of the chest, abdomen, side or back; and through the electrical system sounds an alarm if this motion ceases. The respiration motion is changed to an electrical signal in the transducer. Two points on the skin surface are selected as reference points and the relative motion of the two points is monitored by a light modulation method. A small transducer is mounted on the skin at the first reference point. A thin and flexible modulation reed which conforms to the curvature of the body is mounted at the second reference point, and extends through a slot in the transducer. The relative motion of the modulation reed with reference to the transducer causes the light intensity impinging on a sensor to change thereby changing the sensor's resistance and whenever light modulation stops, the electronic circuitry produces a visual or audial alarm and the patient is attended.

3,831,587
MULTIPURPOSE VAGINAL AND CERVICAL DEVICE

Herman L. Boyd, Savannah, Tenn., assignor to Raymond H. McAnally, Savannah; Allen C. Selmin, Memphis; Harry Schneider, Memphis; I. A. Jefcoat, Memphis and Richard R. Thais, Memphis, all of, Tenn., part interest to each

Filed Feb. 8, 1973, Ser. No. 330,644
Int. Cl. A61b *1/06*
U.S. Cl. 128—6 7 Claims

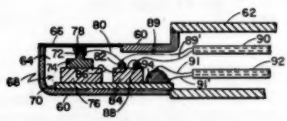


A vaginal and cervical device comprising an elongated tubular member with an air tube connected to a pressure source at one end, a tubular extension structure at the distal end comprised of inner and outer sheets of flexible material which define an air chamber and which may be collapsed into the distal end of the tubular member or deployed therefrom into a fully extended position to provide an opening for observation of a cervix to aid in artificial insemination. Air from the pressure source maintains the tubular extension in the extended position. The outer sheet of the tubular extension may be stretchable to define an expander which is inflated by way of the pressure source or, alternatively, a separate expander may be mounted on the medial portion of the tubular member either of which press against the walls of the vagina to hold the device firmly in place.

3,831,588
PRESSURE SENSING DEVICE

Wilhelm Rindner, Lexington, Mass., assignor to Device Research Inc., North Billerica, Mass.

Filed Oct. 16, 1972, Ser. No. 297,778
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 E 8 Claims



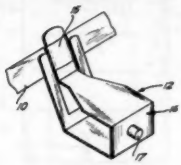
A pressure sensor which produces an electric output proportional to pressure on it is housed in a chamber having a flexible membrane for transmitting external pressure to the sensor. Means are provided for varying the pressure in the chamber by known amounts thus enabling calibration of the pressure sensing system while the sensor is at the site.

3,831,589
SURFACE ELECTRODE ADAPTED FOR USE WITH RHEOGRAPHIC APPARATUS

Raymond M. Deering, Franklin Park, and Raymond M. Pawlak, Addison, both of Ill., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 29, 1973, Ser. No. 327,473
Int. Cl. A61b *5/04*; A61n *1/04*
U.S. Cl. 128—2.1 E 1 Claim

A quickly attachable and detachable surface electrode arrangement, especially adapted for connecting rheographic apparatus to the extremity of a subject such as a human subject for making impedance measurements. A broad, flexible conductive band is provided, adapted to loop around an extremity of the subject in conductive contact with the skin. A clamp is provided to firmly secure the conductive band in the loop, with the band in good conductive contact with the skin. The clamp is adapted to be connected to a conductor for providing an excitation signal to the subject from suitable rheographic apparatus or other electrical equipment. The electrode and clamp arrangement is also capable of use as a receiver elec-

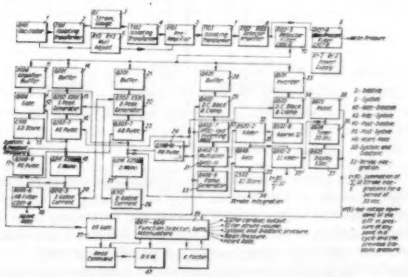


trode. The clamp is easily attachable and removable since it comprises two outer tangs joined at one end to a base to form a fork, and otherwise includes an elongate center tang or tongue which is also joined to the base of the fork by a flexible, spring portion. The tongue can be depressed through the fork by pinching action of an operator and, when released, will spring back through the fork to firmly engage and clamp a portion of the band placed therebetween. The extended ends of the fork tangs and the tongue are formed of flat conductive material whereby excellent electrical contact is achieved with the conductive band, when it is clamped.

3,831,590
APPARATUS FOR MEASURING THE AREA BETWEEN A FLUCTUATING SIGNAL AND AN INCLINED BASELINE

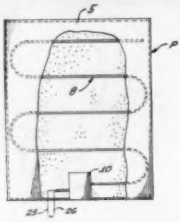
Kenneth Hector McKinnon Boyle, Glasgow, and Thomas Rogers, Milngavie, both of England, assignors to Barr and Stroud Limited, Glasgow, England

Filed May 3, 1972, Ser. No. 250,038
Claims priority, application Great Britain, June 30, 1971, 30573/71
Int. Cl. A61b *5/02*
U.S. Cl. 128—2.05 R 6 Claims



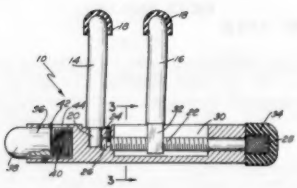
Apparatus for measuring the area between a flucuating signal and an inclined baseline, as for example in measuring cardiac stroke volume and output, wherein the area between the signal and the baseline is measured between two limits. The apparatus comprises an integrator for measuring the area between a curve and a datum baseline coincident with one of the limits of the inclined baseline and extending between the limits, means for measuring the length of the datum baseline, means for measuring at the second limit the distance normal to the datum baseline from the latter to the inclined baseline, means for multiplying the length and the distance measured and halving the product to obtain the area between the baselines, and means for summating the areas.

3,831,591
VIBRATORY CUSHION
Reginald H. Newkirk, 6449 Olympic Blvd., Los Angeles, Calif. 90048
Continuation of Ser. No. 92,634, Aug. 16, 1971, abandoned.
This application Mar. 14, 1973, Ser. No. 341,279
Int. Cl. A61h *1/00*
U.S. Cl. 128—33 **1 Claim**



A seat cushion pad adapted for use over a seat cushion or against a back cushion. The pad is provided with a motor-driven vibration generator of the unbalanced motor type. The motor has a housing to which is coupled one end of an undulatory spring, which extends from the motor housing substantially throughout the area of the pad, acting as a vibration-transmitting device which transmits vibration throughout the area of the pad and to the body of a user sitting or leaning thereon. The end of the spring opposite from that coupled to the motor housing is free or unanchored, so that the vibration amplitude of the spring is not restricted and reduced to zero by an end anchorage.

3,831,592
TRIGGER POINT INSTRUMENT
William E. Lancellotti, 371 Broadway, Providence, R.I. 02909
Filed Jan. 15, 1973, Ser. No. 323,438
Int. Cl. A61h *7/00*
U.S. Cl. 128—60 **4 Claims**

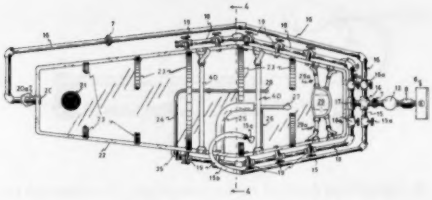


A trigger point instrument for chiropractic use in releasing trigger points in the human body comprising an elongated handle portion with a pair of spaced legs extending from said handle portion in substantially the same direction, the spacing between said legs being readily adjustable, and each of said legs having a resilient tip secured to the outer end thereof, the handle portion also having resilient tips secured to its outer ends, said latter tips being larger than the tips secured to the spaced legs.

3,831,593
THERAPEUTIC TUB FOR THE TREATMENT OF BURNED PATIENTS
Jose Corona Ochoa, Bezares 40, Mexico City, Mexico
Filed July 13, 1973, Ser. No. 378,863
Claims priority, application Mexico, July 14, 1972, 137020
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **10 Claims**

An improved therapeutic tub for the treatment of burned patients comprises a container having a shape suitable to maintain a patient submerged in a leaned positioned thereinto, an isotonic or hypertonic liquid medium in said container, recycling means connected to said container to recycle said liquid medium, filtering and purifying means connected to said recycling means, uretral and rectal probe means to continuously carry human fluids and defecations outside of said container, thermostat means to maintain the temperature of said liquid medium at a constant level, percolating means at the discharge holes of the container to avoid passage of fragments released from the wounds, head support means and body support means within said container, said body support means having a small contact area to avoid injuries to the body of the patient, irrigation nozzle means to irrigate difficulty accessible areas of the body of the patient, and removable cover means on the top of the container to isolate the nude body of the patient from the environment.

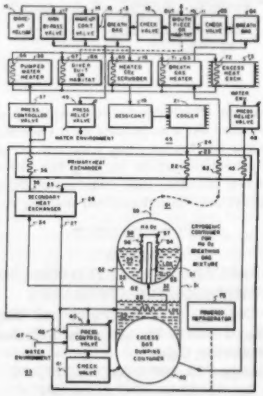
The liquid medium in said container, when hypertonic, can also contain medicaments to be absorbed by osmosis through the skin of the patient.



ERRATUM

For Class 128—80 see:
Patent No. 3,831,467

3,831,594
LIFE SUPPORT SYSTEM
Charles R. Rein, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Mar. 5, 1973, Ser. No. 337,782
Int. Cl. A62b *7/06*
U.S. Cl. 128—142 **16 Claims**



A closed cycle HeO_2 cryogenic underwater life support system is disclosed as including a breathing gas rejuvenation

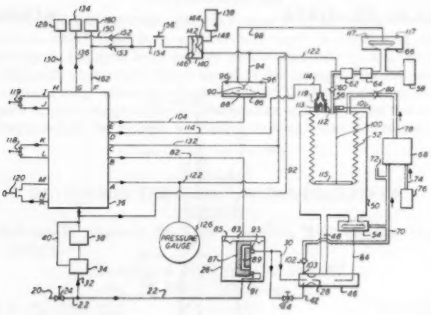
process, wherein helium gas is added thereto to maintain proper breathing gas pressures at various and sundry water depths, carbon dioxide and water are removed therefrom, and life-sustaining oxygen gas is added thereto from liquid oxygen cooled to cryogenic temperatures by means of a cryogenic chamber and refrigeration apparatus. Controlled heating equipment is also disclosed for the purpose of maintaining proper temperatures in said breathing gas rejuvenation process, as well as in a diver's suit. Excess non-rejuvenated gas is stored in a gas dumping container located within the cryogenic chamber, but may be vented to the ambient water environment should said gas dumping chamber become full.

3,831,595

RESPIRATOR

James D. Valenta, Madison; Ulrich Sielaff, McFarland, both of Wis., and Stephen H. Drabkin, Woodbridge, Conn., assignors to Airco, Inc., New York, N.Y.

Filed July 25, 1972, Ser. No. 275,019
Int. Cl. A61m *16/00*
U.S. Cl. 128—145.8 **16 Claims**



A volume-limited general medical respirator is controlled by an integrated fluidic circuit. The respirator includes various alarm systems, control valving and main exhalation and inhalation phases operated entirely through gas means. A collapsible bellows is utilized to inspire the patient and is powered by an operative gas such as oxygen. The same operative gas not only powers the bellows during inspiration of the patient but is then recycled during the exhalation phase and thereafter used in the system for introduction to the patient during the subsequent inspiration phase.

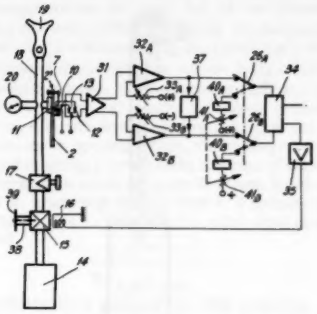
3,831,596

CONTROL DEVICE FOR A RESPIRATORY APPARATUS

Roger Paul Charles Cavallo, Bourg-la-Reine, France, assignor to Synthelabo, Paris, France

Filed Nov. 7, 1972, Ser. No. 304,487
Int. Cl. A61m *16/00*
U.S. Cl. 128—145.8 **10 Claims**

Respiratory apparatus having an electromagnetically operated valve for controlling the flow of respirable gas from a source thereof to a mouthpiece has a control arrangement for opening and shutting the valve in accordance with pressure changes appearing during periods of inhalation and exhalation



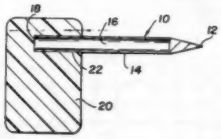
by a patient using the apparatus. Alternatively, the valve can be opened and shut according to a predetermined cycle.

3,831,597

APPARATUS FOR INSERTING EAR RINGS

Jack G. Shiller, Westport, Conn., assignor to Seymour Oestreicher, Westport, Conn.

Filed Dec. 8, 1972, Ser. No. 313,335
Int. Cl. A61b *17/34*; **A44c** *7/00*
U.S. Cl. 128—330 **3 Claims**



Method and apparatus for piercing ear lobes and inserting ear rings therein. The apparatus includes a needle having a hollow shank with an open end over which a handle is removably located. The needle is manipulated by the handle to pierce the ear and the handle is removed. An ear ring having a post is inserted within the needle and the needle is removed leaving the ear ring in place.

3,831,598

STERILE ANESTHETIC INSTRUMENTS

Irvin D. Tice, 192 East State St., Salem, Ohio 44460

Filed Sept. 28, 1972, Ser. No. 292,942
Int. Cl. A61m *35/00*
U.S. Cl. 128—172.1 **3 Claims**

A self contained cataphoric device which may be conveniently hand held by or attached to the patient for locally anesthetizing an area of tissue. The device includes a central body portion containing a battery having one terminal connected to an electrically conducting outer surface. Connected to one end of this central body is a rigid arm having an electrical contact socket connected to the remaining battery terminal and located at the opposite end of the rigid arm for receiving an absorbent pledget made of material such as compressed felt. The absorbent material is saturated with a conventional anesthetizing agent. Typically, the patient will hand hold the central body portion thus automatically making electrical contact with one terminal of the battery through the

outer conducting surface. The saturated pledget will then be applied to the area where anesthesia is desired thus completing an electrical circuit through the body such that significant

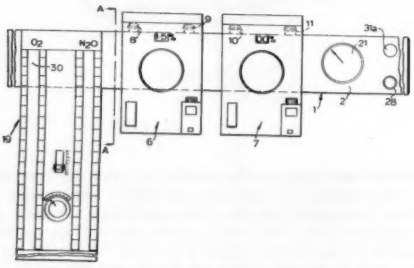
amounts of the anesthetizing agent are physically transported by the electrical current below the skin surface in the desired local area to achieve anesthesia.

3,831,599

ANAESTHESIA MACHINES

David Alan Needham, Keighley, England, assignor to Cyprane Limited, Keighley, Yorkshire, England

Filed Sept. 8, 1972, Ser. No. 287,492
Int. Cl. A61m *16/00*
U.S. Cl. 128—188 **13 Claims**



A console rack for anaesthesia equipment, the rack having apparatus whereby an anesthesia unit can be plugged into position by access from the front of the rack and held in that position. The plug apparatus may be plug or socket elements for receiving mating connecting elements on an anaesthesia unit and may be appropriately interconnected by fluid circuit pipework built into the rear of the console rack. Bays on the rack for receiving anaesthesia units, and anaesthesia units for fitting in these bays may be designed on the modular principle.

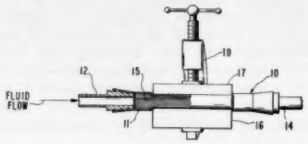
3,831,600

FLUID FLOW CONTROL

Su Il Yum, Mountain View; Richard G. Buckles, Menlo Park, both of Calif., and Richard M. Barrer, London, England, assignors to ALZA Corporation, Palo Alto, Calif.

Filed Apr. 2, 1973, Ser. No. 346,749
Int. Cl. A61n *05/14;* **F16k** *7/06*
U.S. Cl. 128—214 R **9 Claims**

An improved variable fluid flow control is disclosed. This control employs a fluid-containing deformable elastic conduit having a plurality of parallel elastomeric fibers positioned axially within. Fluid passes through the conduit along the fibers. The rate of fluid flow is altered by applying a greater or lesser



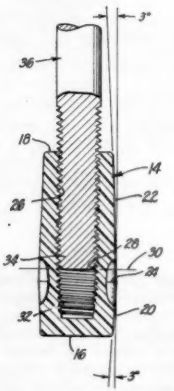
deforming compression, perpendicular to the direction of fluid flow, to the conduit at the location of the parallel aligned elastomeric fibers.

3,831,601

ADJUSTABLE SYRINGE PLUNGER

Archie Kessell, Huntington Beach, Calif., assignor to Rohe Scientific Corporation, Santa Ana, Calif.

Filed Oct. 29, 1973, Ser. No. 410,385
Int. Cl. A61m *5/22*
U.S. Cl. 128—218 PA **6 Claims**

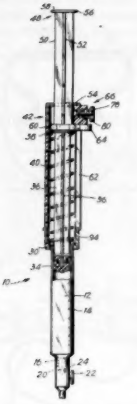


An adjustable syringe plunger of Teflon and of a size to fit into the cylinder of the syringe and having forward and rearward ends, the plunger being axially tapered externally thereof toward its forward and rearward ends from an annulus adjacent its forward end. The plunger has a threaded axial, cylindrical bore therein extending from its rearward end toward its forward end and terminating in an inner end just rearwardly of the annulus, the plunger having a threaded tapered bore forming an axial continuation of the cylindrical bore and converging from the inner end of the cylindrical bore to adjacent the forward end of the plunger. A stem is threaded through the cylindrical bore and into the tapered bore to expand the plunger in its cylinder, thereby providing a relatively wide band of engagement between the plunger and the cylinder in the area of the annular intersection of the two external axial tapers.

3,831,602
ADJUSTABLE SYRINGE ASSEMBLIES

Samuel Broadwin, New York, N.Y., assignor to Union Plastics Corporation, Springfield, N.J.

Filed Feb. 11, 1972, Ser. No. 225,505
Int. Cl. A61m 5/22
U.S. Cl. 128—218 F 2 Claims

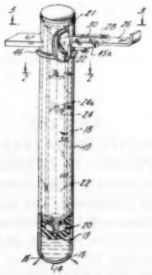


An adjustable syringe assembly capable of adjusting the extent to which fluid is drawn into a syringe. A plunger of the syringe is engaged by a pusher which is guided by a support releasably connected with a barrel of the syringe. This support carries a stop which is adjustably fixed to the support in the path of movement of part of the pusher so as to adjust the extent to which the plunger is displaced along its suction stroke.

3,831,603
DEVICE FOR THE ORAL ADMINISTRATION OF MEDICINE

Nicholas P. Armenti, 50 Thorn Terrace, West Orange, N.J. 07052

Filed June 6, 1972, Ser. No. 260,265
Int. Cl. A61j 7/00; A61m 5/22
U.S. Cl. 128—222 9 Claims

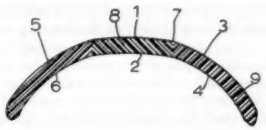


The present invention constitutes a device for the oral administration of medication, including (1) an elongated hollow cylinder having an opening at one end and a plurality of apertures at an opposite end, the opposite end intended for placement into a pool of liquid medication, the cylinder also having a side wall opening; (2) a reciprocating plunger received within the cylinder, the plunger including a forward portion for assuring an air-and liquid-tight fit between the circumferential periphery of the forward portion and the interior walls of the cylinder, and a shank portion having a radially projecting measuring shelf; (3) a slidable member supported by a radial plane element near the open end of the cylinder, wherein the slidable member will, after a sufficient withdrawal of the plunger toward the open end of the cylinder, pass through the side wall opening and engage the measuring shelf, thereby securing a withdrawal into the cylinder of a predetermined volume of medication, the volume being a function of the longitudinal location of the measuring shelf on the shank portion of the plunger; (4) a bottle for holding medicine, the bottle having a mouth and a cover connected to the mouth, the cover having an opening therein, the opening receiving the cylinder and attaining a press-fitable insertion of the cylinder into the opening, in which the press-fit is both liquid-and air-tight, and in which the opening itself is a partially circumferential female slot for receiving the radial plane element of the cylinder.

3,831,604
METHOD OF RESHAPING THE CORNEA

Charles W. Neefe, P.O. Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 352,227, April 18, 1973, Pat. No. 2,776,230, which is a continuation-in-part of Ser. No. 241,904, April 7, 1972, which is a continuation-in-part of Ser. No. 45,333, June 11, 1970, which is a continuation-in-part of Ser. No. 562,002, May 16, 1966, abandoned. This application Sept. 19, 1973, Ser. No. 398,665
Int. Cl. A61m 7/00
U.S. Cl. 128—260 10 Claims

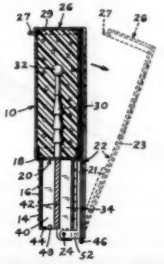


A method of correcting refractive errors of the eye by changing the shape of the cornea by softening the corneal tissue by the application of heat in the form of ultra sonic energy with and without the presence of chemical compounds to reshape the convex cornea to the curvature of the surface of a concave mold applied to the cornea.

3,831,605
MULTIPURPOSE APPLICATORS

Erick-Pierre Fournier, 30 Park Ave., New York, N.Y. 10022

Filed Jan. 26, 1973, Ser. No. 327,237
Int. Cl. A61f 13/20
U.S. Cl. 128—263 19 Claims



Applicators for liquid or solid matter are disclosed that are capable of a single or multiple uses. They are characterized by

an outer tube and an inner ejecting means slidably positioned therein, said ejecting means including a plunger element that includes a foldable handle means.

3,831,606

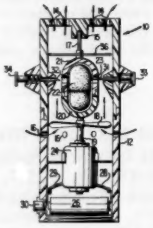
AUTO INHALER

Nalinkant C. Damani, Mountain View, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 117,015, Feb. 19, 1971, abandoned. This application Oct. 24, 1973, Ser. No. 409,243

Int. Cl. A61m *15/08, 13/00*

U.S. Cl. 128—266 4 Claims



An improved device and process for the oral inhalation of medicaments in finely divided form is disclosed. The device has a hollow elongate housing having one end adapted for insertion into the oral or nasal cavity of a user, this end having at least one air passageway therein. There is at least one other air passageway near the other end of the housing. A propeller attached to a medicament container is rotatably mounted in the housing. Piercing members are provided for perforating the medicament container. There is also a self-contained power source for rotating the propeller and the medicament container to dispense the medicament in a positive pressure airstream. Optionally, the device contains an atomizer rotatably mounted in the housing intermediate the medicament container and the medicament dispensing end of the device.

3,831,607

ELECTROCOAGULATION GRASPING FORCEPS FOR TUBE STERILIZATION BY MEANS OF BIPOLAR HIGH FREQUENCY HEAT RADIATION

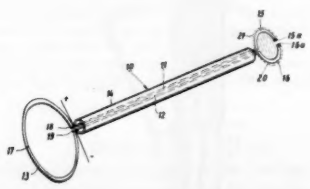
Hans-Joachim Lindemann, Kleiner SchaferKamp 43, Hamburg, Germany

Filed Mar. 7, 1973, Ser. No. 339,011

Claims priority, application Germany, Feb. 10, 1972, 7305040

Int. Cl. A61b *17/36*; A61n *3/04*

U.S. Cl. 128—303.17 2 Claims



The invention relates to a electrocoagulation grasping forceps for tube sterilization for the elimination of sick parts of the tissue by means of punctiform and section-taking heat radiation without damaging sound parts of the tissue.

3,831,608

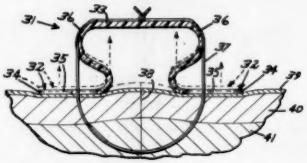
SUTURE BRIDGES

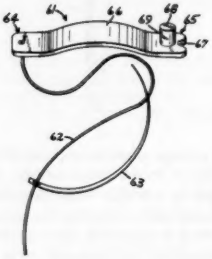
Harold D. Kletschka, Minneapolis, and Edson H. Rafferty, Excelsior, both of Minn., assignors to Bio-Medicus, Inc., Minnetonka, Minn.

Filed Nov. 24, 1972, Ser. No. 309,466

Int. Cl. A61b *17/04*

U.S. Cl. 128—335 18 Claims





The disclosure is directed to a surgical bridge for supporting incision sutures under continuous tension. One form of the surgical bridge comprises an elongated member constructed to bridge the incision, and which is resiliently flexible under the influence of suture tension to compensate for swelling of the incision as it heals. In another form, the bridge includes slotted end guides which are respectively disposed under elevated suture support points, which structure precludes cutting or slicing of the patient's skin by the suture itself upon pressured lateral movement of the bridge over the skin surface.

3,831,609

SMOKABLE SUBSTITUTE MATERIAL AND SMOKING PRODUCTS THEREOF

Theodore S. Briskin, Beverly Hills; Norman G. Schnautz, Van Nuys, and Inderjit Sabherwal, Los Angeles, all of Calif., assignors to Sutton Research Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 226,267, Feb. 14, 1972. This application May 10, 1972, Ser. No. 252,003

Int. Cl. A24b *3/14, 13/00*

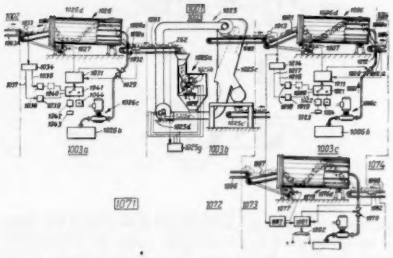
U.S. Cl. 131—2 14 Claims

A smokable material designed to be used for cigars and cigarettes and having waterproof properties is disclosed. The material comprises a composition of a vinylene carbonate, the homopolymer or copolymers thereof, and a combustible filler, such as carbon, cellulose, cellulose derivatives or tobacco. The principal combustion products of the vinylene carbonate employed are carbon dioxide and water.

3,831,610
MACHINE FOR BLENDING TOBACCO OR THE LIKE

Waldemar Wochnowski, Hamburg-Volksdorf, and Helmut Baumann, Hamburg-Bergedorf, both of Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg-Bergedorf, Germany

Division of Ser. No. 635,597, May 2, 1967, Pat. No. 3,590,826.
This application July 2, 1971, Ser. No. 159,350
Claims priority, application Germany, May 4, 1966, 5930079; May 13, 1966, 5939079; May 17, 1966, 5942679
Int. Cl. A24b *07/14, 09/00*
U.S. Cl. 131—21 R 10 Claims

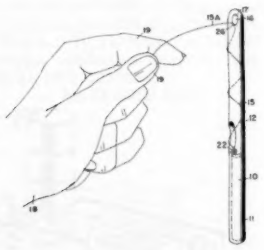


A machine for blending various types of tobacco has a blending unit and several conveyor lines which supply to the blending unit different types of tobacco and at least one of which contains at least one adjustable processing apparatus for the treatment of the respective tobacco type. One or more signal generating detectors are provided in at least one other conveyor line to scan the rate of supply of tobacco and to adjust operating means for the processing apparatus in dependency on changes in the tobacco supply.

3,831,611
DENTAL FLOSS UNIT

Thelma Hendricks, La Grange, Ga., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 6, 1973, Ser. No. 330,119
Int. Cl. A61c *15/00*
U.S. Cl. 132—92 R 1 Claim

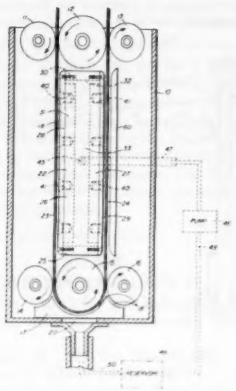


A unit for handling dental floss, for the purpose of cleaning the teeth, in the form of a cylindrical rod with the dental floss contained on a spindle inside the rod and led out through a hole in the side. The dental floss is wrapped several turns around the rod and led through an eye opening at the rod's end with the free end of the floss grasped by one hand and the rod about which the floss has been wrapped grasped with the other hand when cleaning the teeth. One edge of the eye opening at the end of the rod is finished with a cutting edge so that after a section of dental floss has been used, it may be cut off.

3,831,612
APPARATUS FOR TREATING A MATERIAL

Raymond F. Limoges, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 15, 1972, Ser. No. 289,527
Int. Cl. B08b *3/00*
U.S. Cl. 134—122 8 Claims

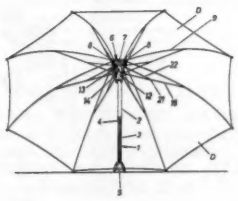


A device is disclosed that can be mounted within an enclosure relative to one or more surfaces of a material to be treated and to a prescribed path through which the material is to be moved. A liquid with which the material is to be treated is pumped under pressure into a chamber from which it is expelled with a vortex action. This action forms a low pressure area which holds the material in contact with the liquid layer on the facing surface of the plenum member. With such a structure, the material is maintained at a fixed distance relative to the surface of the plenum member and a maximum agitation of the liquid is obtained due to the vortex action.

3,831,613
UMBRELLA

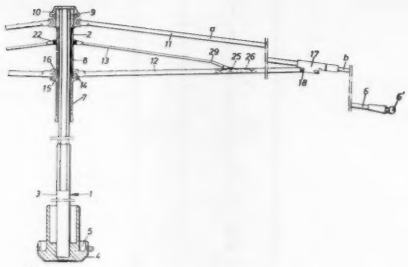
Heinz Weber, Durerweg, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada

Filed Aug. 7, 1972, Ser. No. 278,432
Int. Cl. A45b *19/06*
U.S. Cl. 135—20 R 7 Claims



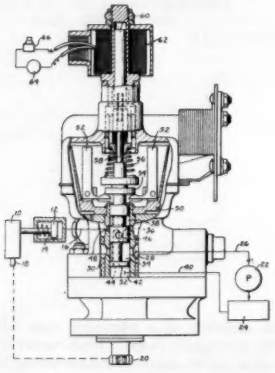
A flat umbrella of a telescopic type having a crown of generally rectangular shape, a main runner sliding on the telescopic stick and an auxiliary runner sliding between the main runner and the crown. The auxiliary runner is relatively more compact than the main runner or the crown. The lateral extensions of the runner converge towards the ends, thereby reducing the area of each lateral extension and allowing the dome ribs and stretcher members, when the umbrella is closed, to be grouped closer together, thereby reducing the size of the collapsed umbrella.

3,831,614
COLLAPSIBLE UMBRELLA
Heinz Weber, Hilden, Germany, assignor to Bremshey AG, Solingen, Germany
Filed Sept. 24, 1969, Ser. No. 860,628
Int. Cl. A45b *19/00*
U.S. Cl. 135—25 4 Claims



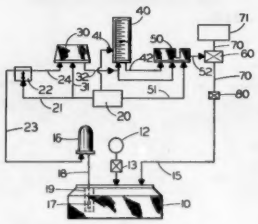
An umbrella having a telescopic stick and shortenable dome ribs which can be stowed in a relatively small package; the dome ribs, struts and stretcher members being arranged such that they fit within each other.

3,831,615
ELECTRICALLY CONTROLLED GOVERNORS
James R. Hartzell, Troy, Ohio, assignor to Piqua Aircraft Company, Piqua, Ohio
Continuation-in-part of Ser. No. 62,859, Aug. 11, 1970. This application Aug. 31, 1972, Ser. No. 285,242
Int. Cl. G05d *13/38*
U.S. Cl. 137—53 4 Claims



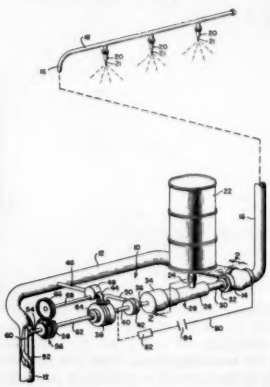
An electric control for a governor in which a governor comprises a speed sensitive actuator, such as a flyball actuator, operating against a spring bias with electromagnetic means associated with the actuator for biasing the actuated element in either one direction or the other.

3,831,616
NOVEL LIQUID CONTROL SYSTEM
Hugo Jozef Weyers, Bornem, Belgium, assignor to Parke, Davis & Company, Detroit, Mich.
Filed Sept. 13, 1972, Ser. No. 288,698
Claims priority, application Belgium, Mar. 13, 1972, 115038
Int. Cl. B29c *13/00*; G05d *24/00*
U.S. Cl. 137—92 3 Claims



An automatic viscosity control system is provided for maintaining a predetermined target viscosity range for pharmaceutical capsule dipping solution used for making capsules by the dip-molding technic. The system comprises means for measuring and amplifying abnormal change in viscosity expressed as an analog and converting the analog to a digital signal for incorporating digital increments of water into the dipping solution as required for viscosity control.

3,831,617
ADDITIVE INJECTION SYSTEM
William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.
Continuation of Ser. No. 194,994, Nov. 2, 1971, abandoned, which is a division of Ser. No. 864,757, Oct. 8, 1969, Pat. No. 3,642,072. This application May 16, 1973, Ser. No. 360,963
Int. Cl. F16k *19/00*
U.S. Cl. 137—98 21 Claims



An injection apparatus for introducing a slurry of water swellable gelling agent into a water line feeding a fixed fire extinguishing system to form an ablative extinguishant therein. The apparatus includes a peristaltic pump driven by a hydraulic motor using water at line pressure for motive fluid and controlled by a servomechanism driven in part by a flow sensor to

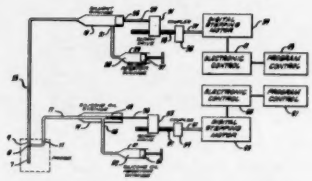
ensure injection rates corresponding to flow rates of water in the line. The injection apparatus is operated in a no-injection failure mode to avoid interference with normal flow of plain water to the fire extinguishing system.

3,831,618

APPARATUS FOR THE PRECISION METERING OF FLUIDS

Max D. Liston, Newport Beach, Calif., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 22, 1972, Ser. No. 317,753
Int. Cl. F16k *19/00*
U.S. Cl. 137—154 **9 Claims**



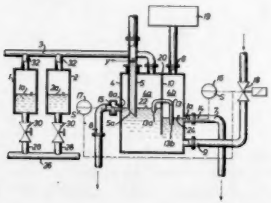
There is disclosed a first capillary conduit having a minute aperture therein, the aperture dividing the first conduit into a separate and a common section, there being a first fluid conducting path formed through the separate and common sections. A second capillary conduit has one end thereof intersecting the first conduit and mating with the minute aperture to form a second fluid conducting path through the second conduit and the common section of the first conduit. The minute aperture forms a first precise interface between the first fluid path and the second conduit. The capillary cross-section of the first conduit separate section adjacent the minute aperture forms a second precise interface between the second fluid conducting path and the separate section, whereby fluid can traverse the first fluid path substantially free from contamination from fluids adjacent the first precise interface and fluids can traverse the second path substantially free from contamination from fluid adjacent the second precise interface.

3,831,619

APPARATUS FOR ACCURATELY MAINTAINING SMALL UNDERPRESSURES IN A TANK SYSTEM WHICH IS CONNECTED TO A GAS SUCTION INSTALLATION

Albrecht Schmidt, Nieder-Roden, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt/Main, Germany

Filed July 18, 1973, Ser. No. 380,267
Claims priority, application Germany, July 21, 1972, 2235757; July 21, 1972, 7227026[U]
Int. Cl. G05d *16/00*
U.S. Cl. 137—206 **3 Claims**



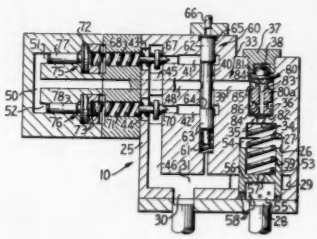
An apparatus for accurately maintaining small underpressures in a tank system which is connected to a gas suction installation comprises a vessel which is partly filled with liquid and which has a partition wall which extends downwardly from the top thereof and terminates below the liquid level. A tank system which has one tank or plurality of tanks which are partly filled with liquid is connected to a gas collection conduit above the liquid level and this gas collection conduit terminates in a first chamber portion of the vessel on one side of the partition wall above the liquid level. In addition, a gas suction installation conduit is connected into the same chamber and terminates in a lower end opening in the vicinity of the liquid level. An external air conduit is connected into the second chamber on the opposite side of the partition wall. An equalizing compensating tube is connected between the first and second chambers through the partition wall and the respective ends terminate at distinctive levels in the respective chambers so that they will lay slightly below the top of the water level therein. The gas suction installation conduit lies with its lower open end located above the discharge height of a discharge conduit of the second chamber by an amount corresponding to the desired underpressure. The first chamber has a discharge conduit which lies above the termination of the gas suction installation conduit.

3,831,620

VALVE DISABLING DEVICE

Donald L. Bianchetta, Coal City, and Kenneth R. Lohbauer, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 12, 1972, Ser. No. 243,396
Int. Cl. F16k *21/04, 51/00*
U.S. Cl. 137—269 **3 Claims**



A valve disabling device for a fluid valve having a moveable control element operative for selectively controlling fluid communication through the valve comprises a disabling member disposed adjacent the control element and operative in a first position to permit normal movement of the control element and moveable to a second position to prevent normal movement of the control element.

3,831,621

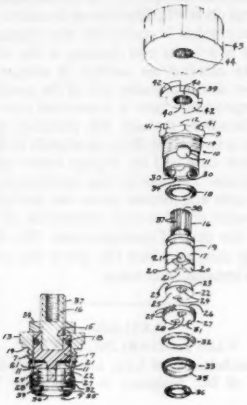
ROTARY SLIDE VALVE

Robert C. Anthony, White Bear Lake, and Donald W. Byland, St. Paul, both of Minn., assignors to Union Brass and Metal Manufacturing Company, St. Paul, Minn.

Filed Nov. 19, 1973, Ser. No. 417,369
Int. Cl. F16k *11/06*
U.S. Cl. 137—270 **2 Claims**

Ceramic disks, rotor and stator, each with two apertures located symmetrically in opposite quadrants and each having one optically flat surface in contact at an interface, are combined with associated elements within a cylindrical cartridge, the stator sealed to the open end of the cartridge, the rotor subject to rotation in the claws of a clutch driven by a control shaft sealed through the opposite closed end of the cylinder and by means of which the rotor may be turned to align the apertures, opening a passageway through the interface, or rotated 90° from that position to close the passageway. Ports

in the cylinder wall adjacent to the rotor provide exit passage from the cylinder. A limit washer with two lugs is keyed to the control shaft and limits rotation to one quarter turn, 90°, by interference of the lugs with two stops on the closed end of the



cartridge. The keys are 45° removed from the lugs on the limit washer; consequently a "left-hand" valve is convertible to a "right-hand" valve (and vice versa) by turning the limit washer face over face.

3,831,622

CLOSURE FOR SPONGE IRON DISPENSER

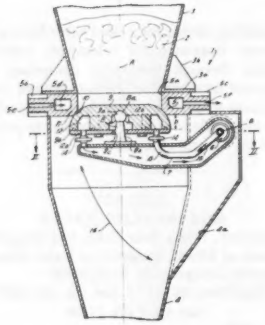
Rudolf Grewer, and Herbert Hickmann, both of Oberhausen, Germany, assignors to Thyssen-Niederhein AG Hutten- und Walzwerke, Oberhausen, Germany

Filed Feb. 20, 1973, Ser. No. 333,742

Claims priority, application Germany, Feb. 24, 1972, 2208774

Int. Cl. F16k *49/00*

U.S. Cl. 137—340 **6 Claims**



A flap-type closure for a device for the feeding of sponge iron to a transport vessel, adapted to receive the product of a furnace for the direct reduction of iron ore, comprises a substantially horizontal annular seat and a substantially horizontal pivot shaft connected to the flap by a swingable arm. A pin between the arm and the flap allows relative swiveling motion of the flap with respect to the arm, and the flap is convex toward the seat to provide selfcentering positioning of the flap against the seat.

3,831,623

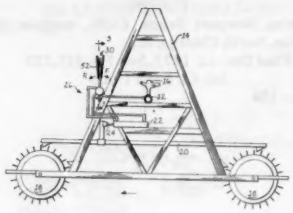
RECIPROCATING CABLE ALIGNMENT ACTUATOR

Ralph D. Boone, 29020 Axtell, Clovis, N. Mex. 88101

Filed Feb. 8, 1973, Ser. No. 330,716

Int. Cl. B05b *15/06*

U.S. Cl. 137—344 **25 Claims**



An irrigation system is aligned by a reciprocating alignment cable extending the length of the system. With systems having reciprocal fluid motor drive, the valve for each motor is actuated solely by the alignment cable. A lost motion device attaches the cable to each of the valves so the first movement of the cable moves the valve (if the vehicle is to move because of its position); additional movement of the cable is lost.

The cable is guided to the pipe between vehicles to compensate for rough terrain. The cable is counter weighted for compensation on graded terrain.

3,831,624

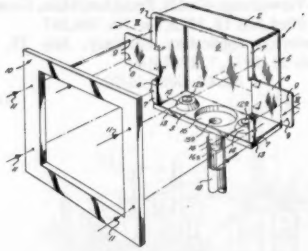
PLUMBING OUTLET BOX

Constantine R. Doumany, Dallas, Tex., assignor to Conrad Industries Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 104,593, Jan. 7, 1971, Pat. No. 3,718,154. This application Feb. 20, 1973, Ser. No. 333,769

Int. Cl. F16l *5/00*

U.S. Cl. 137—360 **1 Claim**

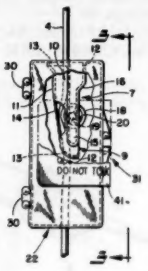


A laundry plumbing outlet box having a waterproof trough formed in the bottom thereof to prevent leakage. The bottom of the box is of unitary plastic construction and has a downwardly extending neck around a drain opening formed therein. Upwardly extending surfaces are formed around openings in the bottom of the box through which pipes extend. The neck around the drain opening extends downwardly into a drain pipe.

3,831,625
INTRAVENOUS SAFETY DEVICE

Deborah Lynn Roediger, 7140 Jackson St., Mentor, Ohio 44060

Filed Feb. 20, 1973, Ser. No. 333,682
Int. Cl. A61m 5/00; F16l 55/14
U.S. Cl. 137—377 7 Claims

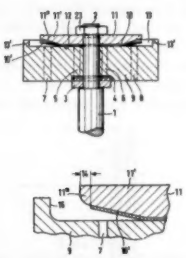


A safety device for intravenous administration of soluble medication or the like is disclosed wherein the valve regulating the flow rate of medication is positioned within an enclosure having a latched pivotable top or lid. A tape label having a warning printed thereon is positioned about such enclosure and the latch thereon to preclude pivotal movement of the top and thus access to the valve unless the tape label is removed.

3,831,626
PISTON FOR A SHOCK ABSORBER

Carl Ulrich Peddinghaus, Obere Lictenplatzer Str. 276, Wuppertal-Barmen, Germany

Filed Dec. 14, 1972, Ser. No. 315,244
Int. Cl. F16k 17/18
U.S. Cl. 137—493.8 10 Claims

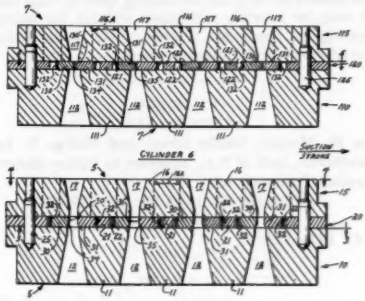


A shock absorber piston in which there is provided a piston body mounted on an end portion of a piston rod. The body has ports therein which open into respective grooves in respective opposed sides of the body. A valve plate is completely received in each groove to overlie the respective port and a support plate is at least partially received in each groove. Each support plate presses flat against a middle region of the respective valve plate but has end portions which allow a variable opening of end regions of the valve plate. The grooves are greater in length than the respective support plates but lesser in length than the diameter of the piston body.

3,831,627
COMPRESSOR VALVE OF THE SLOTTED PLATE TYPE

Paul C. Hanlon, Louisville, Ky., assignor to Dover Corporation, Washington, D.C.

Filed Mar. 14, 1973, Ser. No. 341,288
Int. Cl. F16k 15/02
U.S. Cl. 137—512.1 6 Claims

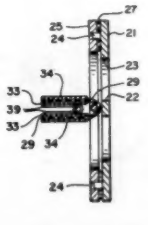


A compressor valve of the slotted plate type comprising: three plates stacked in face-to-face contact, each having a slot which is vertically aligned with the slots in the other two plates, the center plate slot being wider than the bottom and top plate slots; a pair of (right and left) slide bars mounted within the center plate slot for relative slidable movement laterally toward (and away from) each other to close and open the center plate slot and thereby respectively disconnect the bottom and top plate slots from (and reconnect them to) each other to close (and open) the valve; means yieldably urging the slide bars toward each other to close the valve; and means for communicating the fluid pressure in the bottom plate slot laterally in opposite (right and left) directions against the (right and left) slide bars in the center plate slot so that, if the device is operating as an inlet valve assembly, the pressure of the incoming fluid is effective to move the bars laterally away from each other on the suction stroke to open the inlet valve against the action of the spring means, whereas, if it is operating as an outlet valve assembly, the pressure of the outgoing fluid is effective to do ths same thing on the pressure stroke to open the outlet valve in the same way.

3,831,628
CHECK VALVE

Edwin K. Kintner, 1929 Elmbrook Ln., Pittsburgh, Pa. 15243, and C. Edward Titley, 9685 Highland Rd., Pittsburgh, Pa. 15237

Filed Mar. 13, 1973, Ser. No. 340,733
Int. Cl. F16k 15/14
U.S. Cl. 137—512.15 4 Claims



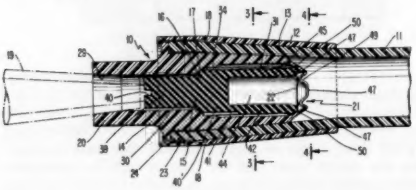
A check valve comprising a flat ring, a diametrically extending support mounted thereacross for supporting a rubber diaphragm. The outer peripheral portion of the diaphragm is

normally seated on the inner peripheral portion of the ring. Thus, fluid pressure effects pivotal flexing of the diaphragm adjacent said support to open the valve. Stiffening segments are fastened to substantially semi-circular portions of the diaphragm. The ring is supported by a plurality of bolts extending through connecting flanges of two pipes along a circular path of greater diameter than the outer diameter of the pipes. The outer periphery of the ring rests on and is centered by the shanks of the bolts. By adding spacing rings the check valve may be laterally withdrawn without the necessity of separating the connected flanges of the pipes. A manually operated shut-off valve may be added.

3,831,629
CHECK VALVE

Glenn H. Mackal, Saddle River, and George E. Lardner, Hawthorne, both of N.J., assignors to Halkey-Roberts Corporation, Paramus, N.J.

Filed Jan. 24, 1972, Ser. No. 219,974
Int. Cl. F16k *15/14*
U.S. Cl. 137—525 **5 Claims**

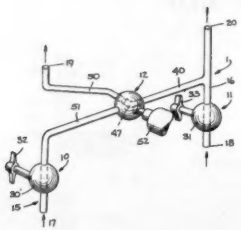


Two-piece check valve having a sleeve-like valve body and a valve element reciprocable therewithin, the valve element having an elastomeric rear end portion integral therewith which is held in axial compression, whereby constantly to urge the valve element forwardly toward valve-closed position. The rear end of the valve body is crimped radially inwardly to form a fluid-passing abutment for the rear end portion of the valve element. The valve also incorporates a novel means for guiding the valve element for reciprocation within the valve body, while maintaining it concentric with respect thereto.

3,831,630
VALVE MANIFOLD

Joseph J. McGavin, Denville, N.J., assignor to Hoke Incorporated, Cresskill, N.J.

Continuation of Ser. No. 202,118, Nov. 26, 1971, abandoned. This application July 9, 1973, Ser. No. 377,410
Int. Cl. F16k *11/22*
U.S. Cl. 137—597 **3 Claims**

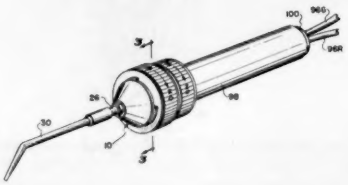


A valve manifold is disclosed which includes simplified ball valve control means for use in a multi-outlet fluid control operation, such as a differential pressure type of fluid flow rate measuring operation. The manifold may include a plurality of ball valves each of which controls an individual fluid conduit as well as an additional ball valve which is arranged to selectively connect the individual conduits together to thereby equalize their fluid outlet pressures as is done, for example, in checking the zero reading of a differential pressure meter.

3,831,631
MICRO TORCH

Walter E. Draxler, Arlington Heights, Ill., assignor to Golconda Corporation, Chicago, Ill.

Filed Feb. 16, 1973, Ser. No. 333,308
Int. Cl. E03b ; E03c
U.S. Cl. 137—606 **14 Claims**

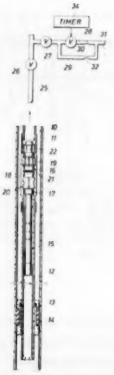


A micro torch for oxygen-acetylene, and other gases, having a handle as small as approximately ¾ inch in diameter and four inches in length, in which the gas mixture controls are knurled members having contiguous edges both movable in the same directions for "on" and "off" adjustably to control roller valves for gas flow proportioning preferably with a gearing drive interengagement between a valve gear and a ring gear segment for micro control of the flame.

3,831,632
REMOTE CONTROLLED SAFETY VALVE

David E. Young, Friendswood, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 235,988, March 20, 1972, abandoned. This application Sept. 14, 1973, Ser. No. 398,260
Int. Cl. F16k *17/34;* **E21b** *33/00*
U.S. Cl. 137—624.13 **13 Claims**



An illustrative embodiment of a downhole safety valve apparatus to control a well in the event of a surface disaster, includes a valve actuator moved in one direction toward valve closing position in response to the normal rate of flow of production fluids, a metering system to retard movement of the valve actuator so that a predetermined time interval must

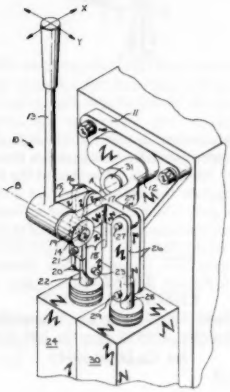
lapse before closure occurs, and a spring that operates during a temporary reduction in flow rate below the normal rate to move the valve actuator in the opposite direction, so that successive reductions in flow rate, one during each predetermined time interval, maintain the safety valve in open position, and the absence of a reduction in flow rate during said time interval enables the valve to close.

3,831,633

SINGLE LEVER CONTROL FOR ACTUATING MULTIPLE CONTROL VALVES

Glen S. Comer, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 28, 1972, Ser. No. 248,564
Int. Cl. F16k *11/18*; G05g *9/04*
U.S. Cl. 137—636.2 **6 Claims**



A bracket is pivotally mounted at its first end on a stationary support for rotation about a first axis. A handle is pivotally mounted on a second end of the bracket for rotation about a second axis which is disposed transversely relative to the first axis. The handle and bracket each have an extension formed thereon which is connected to respective control valve stems whereby pivotal movement of the handle about the first axis will reciprocate one of the valve stems and pivotal movement of the handle about the second axis will reciprocate the other valve stem.

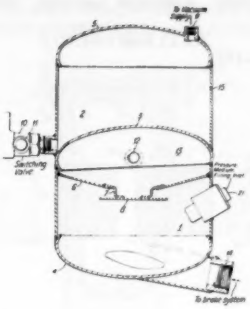
3,831,634

CHARGING CYLINDER FOR A VACUUM OPERATED HYDRODYNAMIC BRAKE SYSTEM

Herbert Schmidt; Rolf Weiler, and Erhard Czich, all of Frankfurt, Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jan. 15, 1973, Ser. No. 323,461
Claims priority, application Germany, Jan. 22, 1972, 2202997
Int. Cl. F16l *51/00*; F15d *1/10*
U.S. Cl. 138—26 **9 Claims**

This relates to a charging cylinder incorporated in a vacuum operated hydrodynamic brake system having a pressure medium (brake fluid) and air to actuate the brakes. In accordance with the present invention, the pooling of the pressure medium of a charging cylinder in the vacuum reservoir upon the return of the pressure medium and air from the hydrodynamic brake is eliminated by constructing the vacuum reservoir to also serve as a plenum chamber. This plenum chamber returns



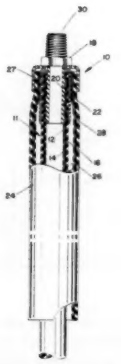
the pressure medium to the charging cylinder through a valve. An assembly is also provided in the charging cylinder to segregate the pressure medium from air as the pressure medium flows back from the brake and retains the pressure medium in the charging cylinder.

3,831,635

PERSONNEL PROTECTION SLEEVE

Frank L. Burton, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed June 30, 1972, Ser. No. 267,814
Int. Cl. F16l *11/00*
U.S. Cl. 138—114 **3 Claims**



A sleeve of predetermined length that fits over one end portion of a high pressure flexible hose assembly. One end of the sleeve is coupled to or near a coupling of the hose assembly while the opposite end of the sleeve is unfastened.

3,831,636

ARMORED TUBING WITH HELICAL OR CIRCULAR CORRUGATION

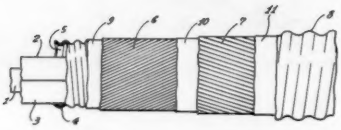
Herbert Bittner, Krahenwinkel, Germany, assignor to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Dec. 6, 1971, Ser. No. 204,887

Claims priority, application Germany, Dec. 28, 1970, 2064053

Int. Cl. F16l 9/04, 9/18

U.S. Cl. 138—173 9 Claims



A corrugated metal tube has radially outwardly bulging corrugation crests which extend helically or circularly around the axis of the tube; a plurality of tensioned, metal strips, are helically wound on and engaging the crests at similar relatively large pitch angles, preferably in the range from 60° to 70°.

3,831,637

DEVICE FOR CONTROLLING THE HEDDLES OF THE HARNESS OF A LOOM

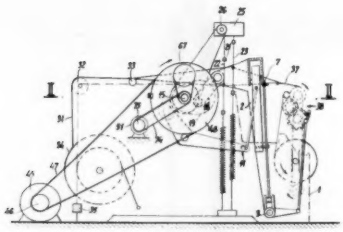
Yves Jullard, Mulhouse, France, assignor to Societe Alsacienne de Constructions Mechaniques de Mulhouse, Mulhouse, France

Filed Jan. 10, 1973, Ser. No. 322,498

Claims priority, application France, Jan. 10, 1972, 72.00593

Int. Cl. D03c 3/32

U.S. Cl. 139—1 E 8 Claims



A loom having a device for driving the dobby which operates the heddles of the harness of the loom. The dobby is driven selectively either from the crankshaft of the loom during normal operation thereof or from an auxillary motor when the loom is stationary and the crankshaft is held stationary at a position corresponding to the wide-open state of the shed of the loom.

3,831,638

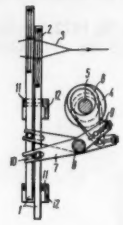
SHEDDING MECHANISM FOR LOOMS

Anatoly Grigorievich Selivanov, ulitsa Lobachevskogo, 44, kv. 59; Nikolai Ivanovich Makachev, ulitsa Tsjurupy, 12, korpus 1, kv. 27; Dmitry Vladimirovich Titov, 13 Parkovaya ulitsa, 27, korpus 2, kv. 49, and Alexandr Aronovich Rotenburg, ulista Krupskoi, 3, kv. 19, all of Moscow, U.S.S.R.

Continuation of Ser. No. 180,621, Sept. 15, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 313,749

Int. Cl. D03d 47/26; D03c 5/00, 13/00

U.S. Cl. 139—12 3 Claims



A shedding mechanism in which there is provided a system of shaft rods reciprocated from eccentrics through clips and angle levers, with forked ends. Mounted in the fork of one end is a means to regulate the shed depth, and in the fork of the other end, a link gear which converts the swiveling movement of the lever into reciprocatory movement of the shaft rods.

3,831,639

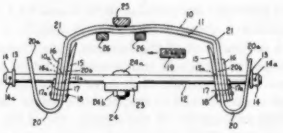
CHECKING DEVICE

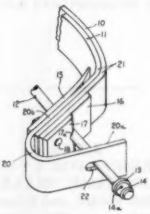
Robet L. Springfield, 106 Galphin Dr., Greenville, S.C. 29609

Filed Oct. 4, 1972, Ser. No. 294,843

Int. Cl. D03d 49/40

U.S. Cl. 139—165 6 Claims



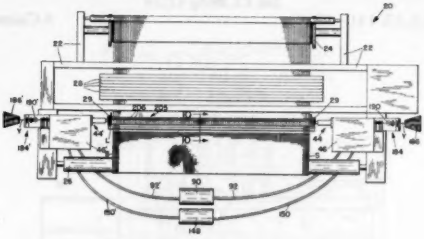


A pair of loop members constructed of resilient flexible strap material are positioned between reinforced end portions of a check strap and an adjacent abutment confining the check strap on each end for limited sliding movement on a rod, so that a loop member is compressed on each stroke of the picker stick preparatory to assisting in producing a following movement of an adjacent end portion on the next stroke of the picker stick to avoid excessive binding of the adjacent end portion.

3,831,640
PNEUMATIC LOOM

Karl W. Wueger, North Brookfield, Mass., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed July 24, 1972, Ser. No. 274,687
Int. Cl. D03j 5/06; D03d 47/24
U.S. Cl. 139—125 15 Claims

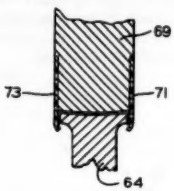


Improved weft inserting elements for a pneumatic loom in which means are provided for: Inserting at least a portion of a filling pick from an outside supply source within a hollow, projectile; pneumatically propelling the projectile and the remainder of the filling pick through a warp shed; and guiding the projectile in a stabilized and airborne flight through the warp shed.

3,831,641
WINDING INSERTING APPARATUS

Leo M. Schlaudroff, and Hollace R. McKinley, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Dec. 4, 1972, Ser. No. 311,815
Int. Cl. B21f 3/00; H02k 15/06
U.S. Cl. 140—92.1 9 Claims



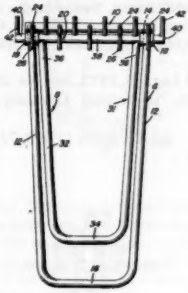
A coil winding and inserting machine having coil forming means for forming a plurality of turns of wire into coils wherein at least a part of the coil forming means may be passed through a stator bore in the direction of the axis thereof to aid in inserting the coils into slots between adjacent teeth of the stator. The inserting part of the coil forming means includes spring means disposed on and moveable with such part. The spring means prevent direct contact between wire and stator tooth sides during the coil insertion process to thereby minimize wire damage.

3,831,642
TOOL FOR TIGHTENING FENCE WIRES OR THE LIKE

George S. Greeott, 9605 Chalk Hill Rd., Healdsburg, Calif. 95448

Filed June 29, 1973, Ser. No. 375,111
Int. Cl. B21f 1/04
U.S. Cl. 140—106 8 Claims

A pliers-like hand operated innovative tool which in use has proved effective when the user is called upon to take up slack and tighten sagging post-supported fence wires (in old or new fences) or alternatively, for crimping and tightening line wires whether woven with vertical stays, plain and smooth or of barbed wire in construction. Two lever or handle units, that is, U-shaped handle-equipped units are provided with opposed confronting shaft-like rod members uniquely and hingedly joined. The primary rod member has forwardly projecting longitudinally spaced brackets, each bracket comprising a projecting shank carrying a V-shaped adapter. The prongs or fingers of the adapter straddle the wire and a portion of the wire

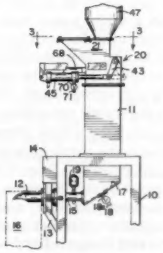


is firmly nested, seated and held in the anvil-like crotch portion. Six, more or less, brackets accommodate a stretch of the wire which is to be bent and suitably crimped in a manner to shorten the wire. The rod member of the second and companion unit provides a rocker shaft equipped with crimping or kinking fingers which are coordinated to coact with the adapters. By holding one handle or lever and actuating the other one relative thereto the desired multiple crimping result is achieved.

3,831,643
BAG FILLING MACHINE HAVING DOOR-TYPE INLET VALVE

Erwin M. Lau, Dolton, Ill., assignor to Black Products Co., Chicago, Ill.

Filed May 21, 1973, Ser. No. 362,258
Int. Cl. B65b 1/18
U.S. Cl. 141—68 11 Claims



The inlet valve is at the top of the pressure chamber, and has a casing, a door-type valve pivotally mounted within the casing which abuts against a doorstop baffle edge. The door valve includes a doorplate having Teflon bar wiping seals along two side edges and the top or hinge edge. The baffle slopes to provide a free space into which the top air is fed. The air blows between the doorplate and baffle edge as the door is in its almost closed position to sweep the abutting edges clear of particles. A time delay retards the door closing movement with respect to the opening of top air supply. Weighing

mechanism controls the door opening movement. A second baffle provides an expansion chamber above the first baffle to accommodate material displaced by the door movement, and a porous wall permits escape of the air sweep air.

3,831,644

FILLING NOZZLE AND INSTALLATION FOR FILLING DRUMS WITH LIQUID YELLOW PHOSPHORUS

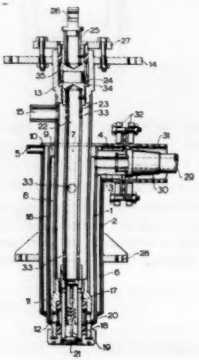
Leo Berg, Hurth-Alstadten, Germany; Gerhard Johann Lenemann, Middlebourg, Netherlands, and Johannes Wilhelmus Kinneging, Schwalbach, Hassen, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack bei Koln, Germany

Filed Aug. 15, 1972, Ser. No. 280,807

Claims priority, application Germany, Aug. 18, 1971, 2141315

Int. Cl. B65b *1/04, 3/04*

U.S. Cl. 141—82 **5 Claims**



Liquid yellow phosphorus is filled into drums by means of a filling nozzle or filling lance. As its essential parts the filling nozzle comprises a control tube provided with a plurality of perforations and connected at its top end to a cylindrical member which carries an eye for the connection of a control unit via a connecting piece of piping. A nozzle supporting tube which concentrically surrounds the control pipe is provided at its upper portion with a warm water inlet, and carries in its bottom portion a control cylinder with a control piston with a hole running through it. The control cylinder is secured via a conical bottom to a nozzle pipe and the nozzle pipe has at its top end a gland with a supporting flange. The nozzle pipe concentrically surrounds the nozzle supporting tube so as to form an annular chamber receiving yellow phosphorus. A heating jacket is arranged around the nozzle pipe so as to form a heating chamber. The heating jacket is fitted it in its upper portion firstly with a double pipe running therethrough and delivering warm water to the heating chamber, and delivering yellow phosphorus to the annular chamber, and secondly with a water outlet. A supporting flange is fixed to the heating jacket and a spring-loaded water outlet valve is arranged at the bottom end of the control piston.

The installation filling drums with liquid yellow phosphorus with the use of the filling nozzle or lance comprises as its essential parts a rotating frame which is movable in a semi-circle, and has a first trolley secured thereto. The trolley is horizontally movable by means of a lifting cylinder. Secured to the first trolley is a second trolley vertically movable by means of lifting cylinders and having the filling nozzle mounted thereon. A third lifting cylinder is connected to the control cylinder of the filling nozzle, and a switch and control desk is arranged on the outside of the rotating frame.

3,831,645

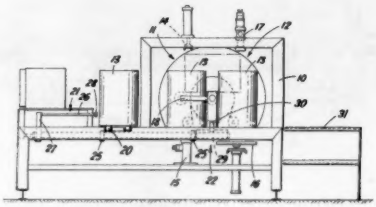
APPARATUS FOR WASHING AND FILLING CONTAINERS

Cyril George Golding; Anthony John Wiggin, and Frank Beech, all of Bilston, England, assignors to GKN Sankey Limited, Bilston, England

Filed Feb. 25, 1972, Ser. No. 229,435

Int. Cl. B65g *47/24*

U.S. Cl. 141—92 **6 Claims**



A machine for washing and filling containers for liquids comprises a washing station, washing means at the washing station, a filling station, filling means at the filling station, means to move a container through the machine comprising a first pusher to push a container to the washing station, transfer means to transfer a container from the washing station to the filling station, and a second pusher to push a container away from the filling station.

3,831,646

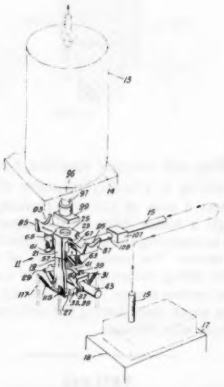
COUPLING DEVICE

Emmanuel V. Gouye, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 19, 1972, Ser. No. 245,348

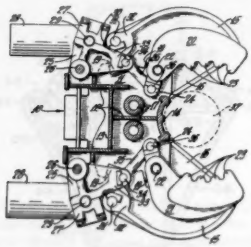
Int. Cl. B65b *1/04, 3/04*

U.S. Cl. 141—383 **10 Claims**



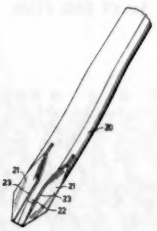
A first conduit is coupled to a second conduit by a plunger that is secured to the first conduit and is movable into engagement with a seating surface on the second conduit. A plunger pusher, activated by fluid operated toggle linkages, moves the plunger pusher and plunger into cooperation with the seating surface. Clamps that are operated by the plunger pusher surround the second conduit and hold the plunger in contact with the seating surface.

3,831,647
CLAMPING AND SHEARING HEAD FOR A TREE HARVESTER
Robert N. Windsor, Brisbane, Australia, assignor to Eaton Yale Ltd., Woodstock, Ontario, Canada
Filed Aug. 10, 1973, Ser. No. 387,556
Int. Cl. A01g *23/08*
U.S. Cl. 144—34 E 5 Claims



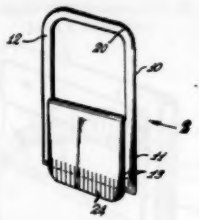
A clamping and shearing head for a tree harvester employing a single pair of actuating cylinders for clamping and shearing. The piston rod of each cylinder acts directly on a shear blade while the cylinder body acts on a tree clamp member through a trunnion mount and bellcrank arrangement. As the shear blade closes against a tree the reaction forces on the cylinder body, acting through the trunnion mount, cause the bellcrank to rotate to close the clamp member against the tree. Once the clamp has closed on the tree the piston rod continues to extend to move the shear blade through the tree trunk.

3,831,648
COMBINED SCREW DRIVING AND SCREW GRIPPING TOOL
Tore L. Hill, Carl Tunbergs vag 6, Solna, and Robert Mankowitsch, Skondalsbrovagen 21, Farsta, both of Sweden
Filed Mar. 20, 1972, Ser. No. 236,143
Int. Cl. B25b *15/02*
U.S. Cl. 145—50 D 2 Claims



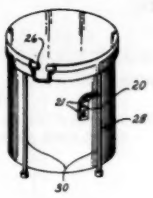
A combined screw driving and screw gripping tool with which a screw can be moved attached to the tool towards and away from a screw hole without fear of being accidently dislodged from the tool. The screw driving portion of the tool is provided with at least one resilient tongue like element whch extends in the longitudinal direction of the tool and which, when inserted in the tool receiving cavity of a screw or the like, exerts a spring force of such magnitude against its contacting surface of the cavity that the screw is held on the tool against accidental dislodgement therefrom.

3,831,649
SHOULDER STRAP BAG
Alvin Whittaker, 5274 Lindley Ave., Encino, Calif. 91316
Filed Mar. 12, 1973, Ser. No. 340,236
Int. Cl. A45c *3/02, 13/26*
U.S. Cl. 150—1.7 2 Claims



A shoulder strap bag formed from a tube of thin flexible material, having a seam across the bottom, and an inverted U-shaped cut above the bag forming the remainder of the material into a shoulder strap and two flaps which may be hung from the upper edges of the bag, one flap folded over the top opening of the bag and hanging outside the upper flap.

3,831,650
LAUNDRY BAG
Sebastian John Consorti, 820 S. McClelland St., Santa Maria, Calif. 93454
Filed June 5, 1972, Ser. No. 259,905
Int. Cl. B65d *33/14, 33/16*
U.S. Cl. 150—7 2 Claims

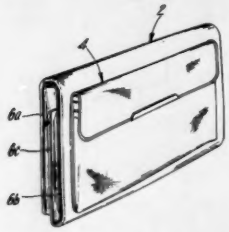


A laundry bag has an open end capable of folding back onto itself around the upper rim of a laundry hamper and to fasten to itself as through hook and pile type fasteners to hold the bag on the hamper. A flap to close the laundry bag has a grommet through which a strap of the bag passes. The strap then fastens to itself with hook and pile type fasteners to close the bag. Strap are provided at the bottom of the bag for transport of the bag as by laundry machinery.

3,831,651
FITTED KIT CONSTRUCTION
Dorothy Leahy, 5 Pinehurst Ave., New York, N.Y. 10033
Filed Nov. 8, 1972, Ser. No. 304,607
Int. Cl. A45c *1/08*
U.S. Cl. 150—35 1 Claim

A fitted kit suitable for use in the manner of envelope-shaped handbag is arranged for carrying small cosmetic items, accessories and the like. A cover member is foldable to provide a handbag-like shape and when opened, one side of the cover member presents holding elements for receiving individual accessories. Further, the cover member forms an envelope closed along one side by a zipper into which certain items can be placed. The cover member is provided with snap

fasteners so that it can be held in the folded closed condition and additional snap fasteners can be formed on its outer surface in the folded condition for securing another envelope-shaped member. The envelope-shaped member secured to the folder cover member has resilient retainer members within its interior for holding cosmetic items in position. When fastened together, the two items form a handbag-like unit or, if preferred, they can be separated and carried as individual members. The cover member can be formed of a handknitted materials folded to provide pockets for the small cosmetic items and accessories. A knitted flap can be formed on the cover member to provide a closure flap when it is folded.



3,831,652

GOLF PUTTER COVER AND TOWEL

Alsie G. Hyden, P.O. Box 16714, Oklahoma City, Okla. 73116, and Bill J. Blundell, Oklahoma City, Okla., assignors to said Hyden, by said Blundell

Continuation of Ser. No. 44,314, June 8, 1970, abandoned. This application Apr. 20, 1972, Ser. No. 245,895

Int. Cl. B65d *65/02*

U.S. Cl. 150—52 G **2 Claims**

A boot-like sheath for covering the head of a putter has secured thereto a towel extension for cleaning and wiping a golf ball.

3,831,653

PUNCTURE-RESISTANT TIRE ASSEMBLY

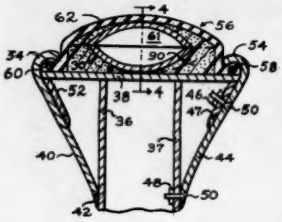
Alvin Edward Moore, 916 Beach Blvd., Waveland, Mich. 39576

Filed Sept. 15, 1972, Ser. No. 289,477

Int. Cl. B60c *5/06*

U.S. Cl. 152—195 **23 Claims**

A vehicle tire casing and inner inflated tubular member of material comprising lead (or optionally other highly malleable metal having high ductility in the range of that of lead and copper, and substantially pure aluminum and tin). Lead, which may be flexed many thousands of times without fracture, is resistant to puncture and may be welded by simple heating without flux, is preferred; when copper, aluminum or tin is used the tubular member is sheathed in and flexibly bonded to a thin-rubber envelope. The invention comprehends a doughnut-shaped lead inner tube; but optionally the tubular member comprises annularly arranged tubular elements, each having a middle portion of greatest inflated bulge, from which portions curvingly slope to wider constrictions at ends of the elements. These constrictions may be: flattened, hermetically bonded plies of the tubular-member material; or only substantially flat, having lines of seam or spot welding, allowing passage of gas between the welds. The invention includes a wheel, having laterally projecting flanges, inward of which casing flanges are held.



3,831,654

TIRE HAVING LATERAL SHIFT OF SALIENT TREAD GROOVE ANGLES

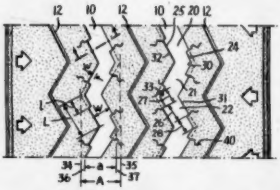
Jacques Boileau, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, France

Filed Feb. 12, 1973, Ser. No. 331,987

Claims priority, application France, Feb. 25, 1972, 72.6965

Int. Cl. B60c *11/06*

U.S. Cl. 152—209 **6 Claims**



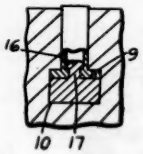
A radial tire for heavy road vehicles comprises a tread formed with wide circumferential zigzag grooves. The sides of the grooves form angles that are alternately salient and reentrant, and the zigzag of at least one of the grooves has its amplitude reduced by a lateral shift of the salient angles along at least one side of the groove. The shift is one of translation without rotation.

3,831,655

ANTI SKID ELEMENT FOR A VEHICLE TIRE

Rudolf Cantz, Stuttgart, Germany, assignor to Kennametal Inc., Latrobe, Pa.

Filed Nov. 3, 1972, Ser. No. 303,316
Int. Cl. B60c 27/00
U.S. Cl. 152—210 2 Claims



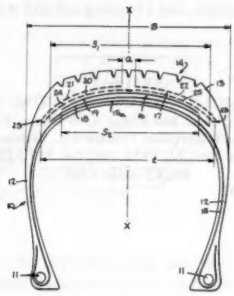
An anti-skid element for a vehicle tire in which the radially inner end of the element is cushioned in the tire tread in which it is mounted to control the force required to push the element radially inwardly into the tire.

3,831,656

BELTED PNEUMATIC TIRES

Gerhard Franz-Josef Senger, and Dionysius Josef Poque, both of Aachen, Germany, assignors to Uniroyal AG, Aachen, Germany

Filed Mar. 27, 1972, Ser. No. 238,076
Claims priority, application Germany, Apr. 1, 1971, 2115914
Int. Cl. B60c 9/64
U.S. Cl. 152—361 FP 13 Claims



Belted pneumatic tire having a reinforcing textile layer disposed between the tread and the carcass. The reinforcing textile layer can be transversely continuous or discontinuous across the crown region of the tire and extends into the shoulder areas. In the shoulder areas the reinforcement is a plural layer formed by a folding over of the textile. The tire may include a metallic breaker located above or below the textile reinforcement. The folded portion of the textile extends beyond the marginal edges by the metal breaker. The cords of either the textile or metal layers can be oriented at zero degrees to the equatorial plane of the tire.

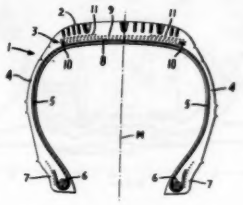
The foregoing abstract is not to be taken either as a complete description or as a limitation of the present invention. The invention is to be understood by the following detailed description and the scope of the invention is to be determined by the claims.

3,831,657

TIRE HAVING FOLDED TREAD-REINFORCEMENT PLY WITH CORD IN EACH FOLD

Jean Paul Dillenschneider, Beaumont, France, assignor to Compagnie Generale Des Etablissements Michelin raison sociale Michelin & Cie, Clermont-Ferrand, France

Filed Feb. 20, 1973, Ser. No. 333,731
Claims priority, application France, Feb. 25, 1972, 72.6964
Int. Cl. B60c 9/00
U.S. Cl. 152—361 FP 2 Claims



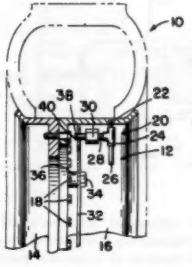
A radial tire having a tread reinforcement including at least one folded tread ply includes in each fold a longitudinal cord forming at least one turn, the ends of the cord being overlapping and not connected. This facilitates the manufacturing process and provides an improved tire.

3,831,658

TIRE REMOVAL MEANS

Eugene M. Poplawski, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 17, 1973, Ser. No. 397,668
Int. Cl. B60c 29/00
U.S. Cl. 152—427 6 Claims



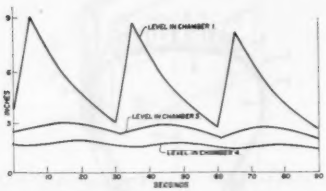
An inflated tire mounted on a two-piece rim includes a lock member which normally blocks off access to the bolts fastening the two-piece rim together. The lock member may be removed to allow access to such bolts only upon removal of a sealing cap which allows the tire to deflate into a condition safe for the disassembly of such rim parts, to allow removal of the tire therefrom.

3,831,659

METHOD OF DISPENSING LOW VELOCITY LIQUID MATERIAL FOR STRIP CASTING

Charles Christian Gerding, Pittsburgh, and Louis John Todora, Aliquippa, both of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Jan. 18, 1973, Ser. No. 324,700
Int. Cl. B22d 11/10
U.S. Cl. 164—82 3 Claims



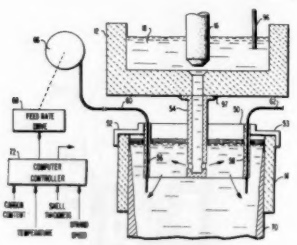
Liquid materials are dispensed at a low velocity through the use of a multi-chambered tundish which induces a dampening effect upon the flow of the liquid material which passes through the tundish. The tundish is well suited as a liquid metal source in continuous strip casting methods.

3,831,660

APPARATUS FOR IMPROVING CONTINUOUSLY CAST STRANDS

William P. Hill, Allison Park, Pa., assignor to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 156,818, June 25, 1971, Pat. No. 3,746,070. This application Apr. 10, 1973, Ser. No. 349,854
Int. Cl. B22d 11/10
U.S. Cl. 164—275 15 Claims



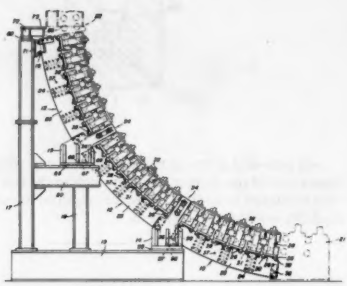
Method and apparatus are disclosed for improving the structure of continuously cast strand by separating undesirable hot metal inclusions at locations spaced from cooling wall surfaces of a continuous casting mold and removing at least a portion of the superheat of molten metal internally of the shape being cast. Apparatus is provided for delivering hot metal subsurface to molten metal level within a continuous casting mold with a component of motion opposite to the direction of casting, initially confining such metal, and changing its direction of movement for separating undesirable inclusions. Apparatus is provided for introducing solid metal below the slag and molten metal surface into the high temperature zone.

3,831,661

ASSEMBLY GAUGE FOR CURVED ROD RACK FRAME CONSTRUCTION

John J. Anderton; Max S. Dudzic, and Wilmer C. Wrhen, all of Oil City, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 265,379, June 22, 1972, abandoned. This application Dec. 19, 1973, Ser. No. 426,291
Int. Cl. B22d 11/12
U.S. Cl. 164—282 2 Claims



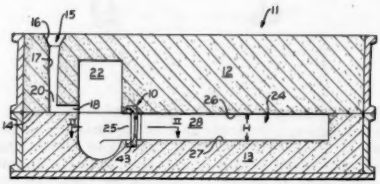
A frame construction for the curved roll-rack of a continuous-casting apparatus, and a method of assembling the rack. The frame is formed of lower, middle and upper sections assembled in aligned end-to-end relation. Each section is pivotally mounted at its exit end and supported on base members at its entry end. The side plates of the sections carry reference pins cooperable with specially designed gauges for accurately positioning roll clusters on the sections, the sections with respect to each other, the base members with respect to the sections, and a bending-roll unit at the entry end of the roll-rack.

3,831,662

CASTING MOLD WITH CONSTRICTING DEVICE

John R. Nieman, Pekin, and Roger A. Worman, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 22, 1972, Ser. No. 317,522
Int. Cl. B22c 9/08
U.S. Cl. 164—362 8 Claims



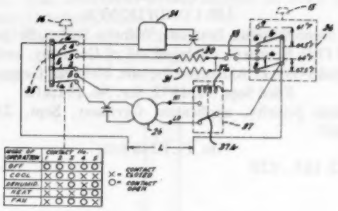
A stricture is formed between riser and cast article in a conventional metal mold casting process to facilitate clean removal of the riser after casting by interposing thin-walled frangible constriction means between riser cavity and casting cavity prior to pouring molten metal; the flow of metal into casting cavity is also regulated thereby.

3,831,663

AIR CONDITIONER

David J. Pithie, Richmond, Ind., assignor to Philco-Ford, Blue Bell, Pa.

Filed Apr. 5, 1973, Ser. No. 348,203
Int. Cl. F25b 29/00
U.S. Cl. 165—26 5 Claims



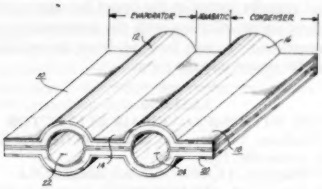
A room air conditioner having an electrical heater that is energized continuously while the evaporator coil is alternately energized and deenergized, in provision of a dehumidification and reheat cycle of operation under conditions characterized by relatively low temperatures and high relative humidity.

3,831,664

HEAT PIPE INTERFACES

John T. Pogson, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 7, 1973, Ser. No. 413,717
Int. Cl. F28d 15/00
U.S. Cl. 165—80 6 Claims



An interface for interconnecting heat pipes is disclosed. The interface is itself a special purpose heat pipe adapted to efficiently transfer heat from the condenser of a first heat pipe to the evaporator of a second heat pipe. Using the present invention, simple heat pipes can be interconnected to form a complex heat pipe structure for particular applications.

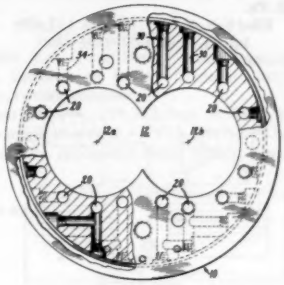
3,831,665

EXTRUDER BARREL TEMPERATURE CONTROL

Dennis A. Knaus, Centerville, Mass., assignor to Packaging Industries, Inc., Hyannis, Mass.

Filed Jan. 19, 1972, Ser. No. 218,873
Int. Cl. F28f 5/06
U.S. Cl. 165—87 6 Claims

At least a part of the barrel of an extruder in which plastic is heated, mixed, pressurized, and forced through a die is formed with a plurality of longitudinal passages all around the bore, close to the bore, and extending substantially parallel to the bore axis. Transverse passages respectively communicate with the longitudinal passages adjacent to opposite ends thereof, and plugs are provided for plugging the ends of the longitudinal passages. By means of these passages a heat-exchange fluid is circulated through the barrel in good heat-exchange relationship with the plastic and at a proper temperature to bring the plastic to a desired temperature. Independent control of the flow of the heat-exchange fluid can be established in different zones.

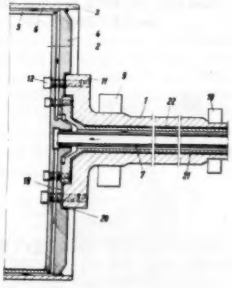


3,831,666

GODET FOR USE IN DRAWING APPARATUS AND DRUM DRYER UNITS

Heinz Fleissner, Frankfurt am Main, Germany, assignor to Vepa Aktiengesellschaft, Riehen-Basel, Switzerland

Continuation-in-part of Ser. No. 121,890, March 8, 1971. This application Jan. 31, 1972, Ser. No. 221,941
Claims priority, application Germany, Jan. 30, 1971, 2104392
Int. Cl. F28f 5/02
U.S. Cl. 165—89 5 Claims

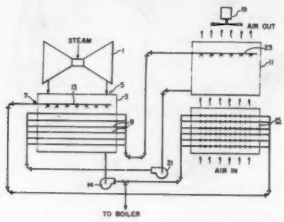


A godet for transporting and heating fibers comprises an outer and an inner cylindrical shell which define an annular space therebetween for the flow of a fluid heating medium, an end wall secured to the outer shell, and a bearing shaft attached to the end wall via radial and axial fitting surfaces. A continuous layer of heat-insulating material is provided for the radial and axial fitting surfaces. Also, a godet construction having means to collect and return leakage oil from the outside of a bearing housing to the inside of the housing is disclosed.

3,831,667
COMBINATION WET AND DRY COOLING SYSTEM FOR A STEAM TURBINE

Lee A. Kilgore, Export, and Kenneth A. Oleson, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1971, Ser. No. 112,659
Int. Cl. F28b *1/02, 3/04, 5/00*
U.S. Cl. 165—96 1 Claim

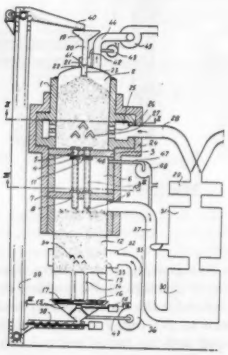


A combination wet-dry cooling system for an axial flow steam turbine having a portion of the exhaust steam from the turbine condensed by cooling water circulating through a condenser and through a wet cooling tower, and having another portion of the exhaust steam condensed by liquid coolant circulated in a finned tube heat exchanger, wherein the heat from the liquid coolant is transferred to the air, and the liquid coolant is passed through the tubes extending through the condenser, or the liquid coolant is sprayed directly into the condenser to provide mixing condensing, thus providing a cooling system, which eliminates the objectionable plume associated with wet cooling towers and which is smaller than dry cooling towers.

3,831,668
TOWER TYPE HEAT EXCHANGERS FOR HEAT INTERCHANGE BETWEEN GASES HEATED TO DIFFERENT TEMPERATURES

Per Torsten Weissenburg, Vireberfsvagen 13, Solna, Sweden (17140)

Filed May 17, 1972, Ser. No. 188,569
Int. Cl. F28d *17/00*
U.S. Cl. 165—107 10 Claims

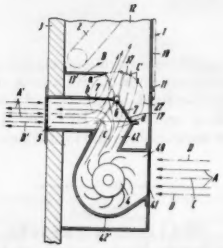


A pebble heat exchanger which uses the waste heat of the exhaust stack to raise the temperature of the intake air for the furnace, thereby acting as an economizer. This heat interchange between two gases at different temperatures, is effected through the medium of small heat-exchange bodies which are arranged to fall freely under gravity through a generally vertically tower with upper, intermediate and lower chamber. The intermediate chamber can be maintained at a pressure above or below atmospheric pressure for purposes of keeping the gases separate so as to prevent contamination therebetween.

3,831,669
AIR CONDITIONER

Heinz Menne, Schloss Neuhaus; Wilhelm Schirp, Bergneustadt, and Otto Eckhardt, Bielefeld, all of Germany, assignors to Benteler-Werke Aktiengesellschaft, Bielefeld, Germany

Filed Sept. 22, 1972, Ser. No. 291,416
Claims priority, application Germany, Sept. 25, 1971, 2148047
Int. Cl. F24h *9/08*
U.S. Cl. 165—122 14 Claims

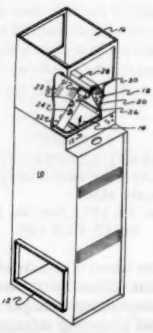


An air conditioner having heat transfer means in an upper portion of its housing, blower means in a lower portion of the housing for sucking air from a room into the lower housing portion, and adjustable air guide means cooperating with said blower means for passing air sucked in by the blower means over the heat transfer means in the upper housing portion or through a duct communicating with the atmosphere outside the room, respectively to pass fresh air from the outside over the heat transfer means into the room.

3,831,670
A-COIL WITH IMPROVED AIR DEFLECTOR

Donald M. Mullings, Yardley, Pa., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 15, 1973, Ser. No. 406,646
Int. Cl. F28f *7/00*
U.S. Cl. 165—124 5 Claims



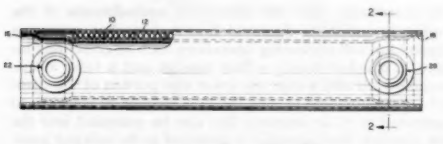
The present invention provides an air guide mounted in the apex area of an "A"-coil evaporator. The air guide is effective

in allowing the air to pass smoothly through the evaporator coils. The air coil guide is arranged to allow an unrestricted air flow through the evaporator plates thereby eliminating eddying of the air in the downstream side of the air guide.

3,831,671
TRANSMISSION FLUID HEAT EXCHANGER IN A MOTOR VEHICLE COOLING SYSTEM
Wilfred L. Was, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Feb. 28, 1972, Ser. No. 229,899
Int. Cl. F28g *13/00*
U.S. Cl. 165—154 **4 Claims**

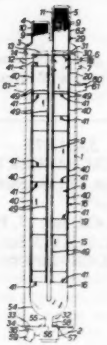
A heat exchanger for cooling transmission fluid of a motor vehicle having a liquid-cooled internal combustion engine and a fluid controlled or operated transmission. The transmission fluid heat exchanger is used in conjunction with the cooling system used to transfer to the atmosphere heat from the liquid used for cooling the internal combustion engine. The transmission fluid heat exchanger preferably is positioned in a tank of a radiator for the purpose of transferring heat from the transmission fluid passing through the heat exchanger to the liquid used for cooling the internal combustion engine. The transmission fluid heat exchanger includes an inlet orifice and an outlet orifice and means for causing the transmission fluid entering the inlet orifice of the heat exchanger to flow initially in a direction away from the outlet orifice and then in a direction toward the outlet orifice.

3,831,672
LIQUID-TO-LIQUID HEAT EXCHANGER
Sylvester J. Battisti, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Continuation-in-part of Ser. No. 131,306, April 5, 1971, abandoned. This application June 2, 1972, Ser. No. 259,095
Int. Cl. F28d *7/10*
U.S. Cl. 165—154 **1 Claim**



A liquid-to-liquid heat exchanger adapted especially for use with an automotive vehicle radiator assembly for transferring heat from automatic power transmission fluid to the engine liquid coolant comprising a pair of cylindrical tubes adapted to be positioned in coaxial disposition within the engine radiator heater and a helical turbulator positioned within an annular space defined by the cylindrical tubes, said turbulator comprising a rolled strip with a channel cross-section, said strip being wound about the axis of the heat exchanger to form a continuous helical flow channel, thus increasing the turbulence in the field flow path for the transmission oil.

3,831,673
HEAT EXCHANGERS
Owen Hayden, Bolton, and Derek Taylor, Knutsford, both of England, assignors to United Kingdom Atomic Energy Authority, London, England
Continuation of Ser. No. 179,342, Sept. 10, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 393,951
Claims priority, application Great Britain, Sept. 18, 1970, 44621/70
Int. Cl. F28f *9/00*
U.S. Cl. 165—158 **13 Claims**

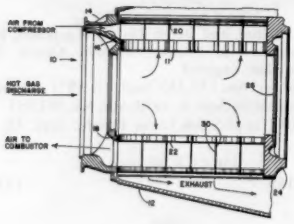


A heat exchanger of the type comprising a shell containing an array of U-shaped tubes arranged longitudinally in the shell. The tubes are assembled in a number of separate tube bundles with the ends of the tubes connected with individual tube plates in separate inlet and outlet header pipes in an end closure head for the shell. Each tube bundle is contained within an individual tubular shroud with ducting for passing heat transfer fluid from outside the shell into one end of the shroud, so that the heat transfer fluid passes through the shroud over the surface of the tubes in the tube bundle and enters the shell of the heat exchanger from the other end of the shroud. The tubes in the individual tube bundles are spaced at points along their length by grids which are connected in an articulated manner by tie bars. The shrouds for the tube bundles comprise individual tubular sleeves extending between adjacent grids so that the shrouds can flex with flexing of the tubes of the tube bundles.

3,831,674
PLATE TYPE HEAT EXCHANGERS
Wolfgang J. Stein, Milford, and Salvatore Straniti, Orange, both of Conn., assignors to Avco Corporation, Stratford, Conn.
Filed Nov. 16, 1972, Ser. No. 307,264
Int. Cl. F28b *3/12, 13/06*
U.S. Cl. 165—166 **7 Claims**

A heat exchanger is described which is adapted for use with a regenerative type gas turbine engine. The heat exchanger comprises a stack of annular disc plates which are joined in bellows fashion. Inlet and exit plenums extend longitudinally of the stack. The plates define alternate flow paths respectively for radial flow of the hot gas discharge outwardly from the center of the stack and for cross flow of pressurized air from the inlet to exit plenums. Alternate plates are provided with flow path defining corrugations formed both radially, in a

general sense, and cross wise, generally concentric of the discs. The remaining plates have generally radially extending, flow paths defining corrugations. The radial corrugations of all



plates are curved to be generally concentric of the curved sides of the inlet and exit plenums which are respectively triangular and elliptical in cross section.

3,831,675

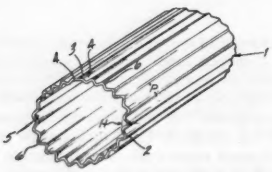
HEAT EXCHANGER TUBE

Charles D. McLain, Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 218,422, Jan. 17, 1972, abandoned. This application Mar. 21, 1973, Ser. No. 343,278

Int. Cl. F28f *1/08*

U.S. Cl. 165—177 **6 Claims**



A heat exchanger tube having a corrugated wall with longitudinally extending corrugations and a process and apparatus for making such tube. The tube is formed from corrugated metal strip which is formed and welded into a tube. The resulting tubing has a longitudinally extending weld seam and portions of the tube surface coextensive with the weld seam on either side thereof are left uncorrugated.

3,831,676

STUFFING BOX FOR WIRELINE WELL APPARATUS

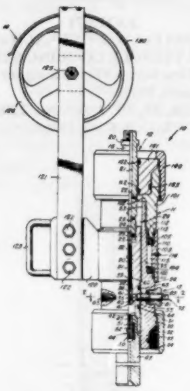
Vernon L. Brown, Belle Chasse, La., and Joseph L. Pearce, Dallas, Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 11, 1972, Ser. No. 313,931

Int. Cl. E21b *33/03*

U.S. Cl. 166—82 **12 Claims**

A stuffing box for use in sealing around a wireline used in the running and pulling wireline equipment in oil and gas wells under pressure. The stuffing box has a removable internal body for enlarging the useable bore through the box to permit passage of tools under certain emergency conditions. The stuffing box is particularly characterized by a fishing neck type head configuration on an internal body which is removable from the housing of the box without rotation. One specific form of the stuffing box includes a union type coupling for attaching the box to a lubricator without rotation. A more specific form of union type coupling is a hand operated quick union. The stuffing box is especially useful in situations where wireline well tools become lodged extending through the



valves in the well surface system precluding pressure sealing around the tools by the valves while dislodging and removing the tools.

3,831,677

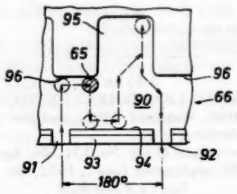
RETAINER PACKER WITH IMPROVED VALVE SYSTEM

Albert A. Mullins, Richmond, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 24, 1972, Ser. No. 309,313

Int. Cl. E21b *33/12*

U.S. Cl. 166—128 **15 Claims**



In accordance with the illustrative embodiments of the present invention as disclosed herein, a packer apparatus adapted for well pressuring operations such as cementing includes a mandrel having a flow passage and a valve sleeve movable vertically within the lower end portion of the mandrel for opening and closing the flow passage in response to manipulation of an operator that can be extended into the flow passage. The operator is arranged to be indexed automatically through a sequence of angular displacements in response to upward and downward movement thereof, and cooperatively arranged coupling structures on the valve sleeve and the operator function to connect the two together so that the valve can be shifted vertically between open and closed positions, and to automatically disconnect the operator from the valve sleeve so that the operator can be withdrawn from the flow passage leaving the valve closed.

3,831,678

METHOD OF PRODUCING AND USING A GELLED OIL BASE PACKER FLUID

Thomas C. Mondshine, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed May 2, 1973, Ser. No. 356,347
Int. Cl. E21b *33/14, 43/00*
U.S. Cl. 166—288 16 Claims

An oil base packer fluid is provided for use in permafrost formations which is pumpable at temperatures less than 50°F and which will gel after placement at its desired location in an annular space in a wellbore when a hot oil or gas is produced through the wellbore. The packer fluid comprises an oil, an organic modified clay gellant, a dispersant for the clay, and, optionally, asbestos, wherein the clay is added to the oil at a temperature less than about 50°F and the temperature of the packer fluid is maintained less than about 50°F before and during placement within the wellbore.

3,831,679

STIMULATION WITH INHIBITED ACIDIZING FLUIDS

C. Travis Presley, and Ronald E. Smith, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed July 5, 1973, Ser. No. 376,631
Int. Cl. E21b *43/27*
U.S. Cl. 166—307 15 Claims

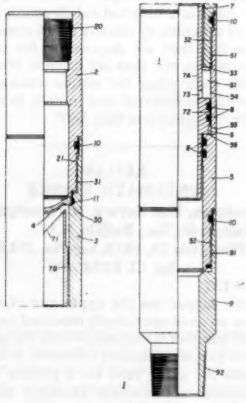
Production and injection wells are stimulated with an inhibited acidizing microemulsion containing hydrocarbon (external phase), surfactant, and acid. The acid is inhibited from reacting with the reservoir rock until it has penetrated the rock face. About 5 – 500 gallons of the microemulsion per vertical foot of formation are useful to stimulate the wells. Carbonate reservoirs are particularly suited for stimulation.

3,831,680

PRESSURE RESPONSIVE AUXILIARY DISC VALVE AND THE LIKE FOR WELL CLEANING, TESTING AND OTHER OPERATIONS

Arnold Glen Edwards, and Charles J. Jenkins, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 224,755, Feb. 9, 1972. This application June 28, 1973, Ser. No. 374,289
Int. Cl. E21b *21/00*
U.S. Cl. 166—311 4 Claims



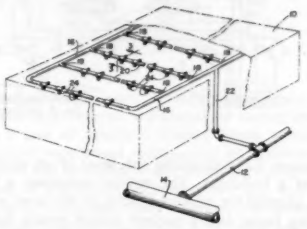
A full opening pressure operated disc valve particularly suited for cleaning formation perforations by surging and for other operations comprises a rupturable sealing element and a sliding tubular rupture member actuated by a controlled pressure differential between the tubing chamber and the casing annulus, with said element and rupture member being located concentrically within a tubular body and having an ID substantially the same as that of the tubing string.

3,831,681

FIRE PROTECTION SYSTEM UTILIZING MODULAR COMPONENTS

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed July 23, 1973, Ser. No. 381,764
Int. Cl. A62c *37/02*
U.S. Cl. 169—16 4 Claims



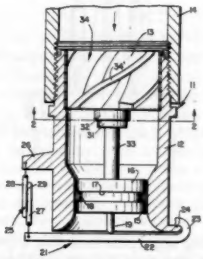
A fire protection system in which a plurality of spaced parallel branch conduits extend perpendicular to a plurality of spaced parallel cross-main conduits and are connected thereto to form a network adapted to be supported in an elevated position in a substantially horizontal plane in an area to be protected by fire. Each cross-main conduit is formed by a relatively long tubular portion and a plurality of relatively short tubular portions integral with the long tubular portion and extending perpendicular thereto. The relatively short tubular portions register with the long tubular portion and are spaced apart along the length thereof for the purpose of connecting to the branch conduits, and a plurality of discharge heads are connected to the branch conduits for discharging extinguishant.

3,831,682

FIRE EXTINGUISHING SYSTEM NOZZLE

Louis A. Calcaro, Pittsburgh, Pa., assignor to Rockwell Manufacturing Company, Pittsburgh, Pa.

Filed Jan. 19, 1973, Ser. No. 324,979
Int. Cl. A62c *37/08*
U.S. Cl. 169—37 14 Claims

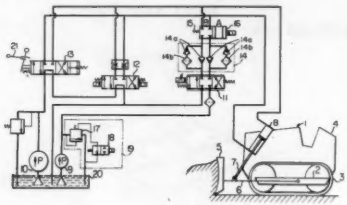


A fluid dispensing nozzle wherein an outlet blocking plug is dually independently restrained by heat responsive means and by a magnetic or mechanical interlock that releases only in response to predetermined fluid pressure.

3,831,683
SYSTEM FOR CONTROLLING THE LEVEL OF AN EARTH-REMOVING BLADE OF A BULLDOZER

Toshimichi Ikeda, Ibaraki-Ken; Masataka Kawauchi; Atsushi Matsuzaki, both of Tokyo, and Masayuki Suzuki, Kashiwa, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Sept. 1, 1972, Ser. No. 285,645
Claims priority, application Japan, Sept. 6, 1971, 46-68049
Int. Cl. E02f *3/76*
U.S. Cl. 172—4.5 **3 Claims**

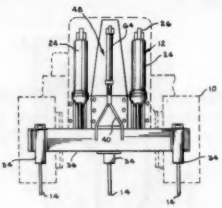


A system for controlling the level of an earth-removing blade of a bulldozer. The system comprises a first circuit means adapted for manual control of the level of the earth-removing blade and a second circuit means automatically operative to keep the earth-removing blade at a predetermined level. The first circuit means is usable in usual earth excavating and removing operation of the bulldozer while the second circuit means is usable to produce a flatly bulldozed earth surface. The second circuit means includes electric and hydraulic circuits. The electric circuit includes an input setting unit, a gyro-means to measure the actual level of the blade, and a circuit for comparing the signals from the input setting unit and gyro-means to emit an instruction signal. The hydraulic circuit includes valves operative in response to the instruction signal to control the amount and direction of the fluid to be fed from a fluid source to a cylinder for the actuation of blade supporting arms of the bulldozer for thereby automatically controlling the blade level.

3,831,684
EARTH WORKING APPARATUS

James L. Thigpen, Harlingen, Tex., assignor to CRC-Crose International, Inc., Houston, Tex.

Filed Feb. 16, 1973, Ser. No. 333,062
Int. Cl. A01b *63/32*
U.S. Cl. 172—248 **3 Claims**

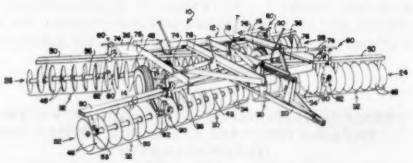


An earth working apparatus including a draw bar having a tool holder adapted to have a earth working tool herein and being pivotally mounted at one end thereof and a pivotal connection at the other end adapted to be connected to a moving vehicle such as a tractor, an actuator for raising and lowering the draw bar about its pivotal connection to the vehicle, a link pivotally connected a one end to the tool holder above its pivotal connection to the draw bar and at the other end to a movable or sliding pivotal connection and an actuator for moving the sliding pivotal connection of said link from a point above the draw bar connection to the vehicle forming a parallelogram type linkage device for the maintenance of the angle of the tool in the tool holder with respect to the ground to a point near the draw bar vehicle connection to form a radial type linkage device for varying the angle of the tool in the tool holder with respect to the ground responsive to the elevation of the draw bar. The earth working apparatus also includes a mounting structure being pivotally mounted to the vehicle and to the draw bar and having an actuator for changing the draw bar and having an actuator for changing the position of said mounting structure with respect to the vehicle. This abstract is neither intended to define the invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,831,685
DISK GANG COUPLING FOR HARROWS AND THE LIKE

Eugen J. Birkenbach, Park Ridge, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Mar. 2, 1973, Ser. No. 337,321
Int. Cl. A01b *5/06, 15/16*
U.S. Cl. 172—568 **8 Claims**



A gang coupling for correlating the rotary movements of the arbor bolts of adjacent aligned disk gang sections of a disk harrow or the like. Cooperating driving and driven coupling members are mounted on the adjacent ends of the coaxial arbor bolts and embody torque transmitting fingers which overlap each other in a longitudinal direction and assume the same degree of eccentricity relative to the common axis of the arbor bolts so that they are disposed in the same cylindrical surface of revolution and thus are capable of side-by-side engagement with each other for torque-transmitting purposes but allow for circumferential lost motion in either direction through an arc of slightly less than 360°.

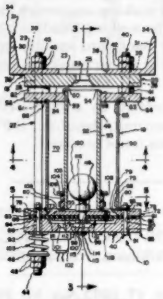
3,831,686
PNEUMATIC RAPPER

Roger S. Brookman, East Aurora, N.Y., assignor to American Precision Industries, Inc., Buffalo, N.Y.

Filed June 28, 1973, Ser. No. 374,813
Int. Cl. B25d *9/00*
U.S. Cl. 173—132 **17 Claims**

A pneumatic rapper has the upper end of a guide tube arranged to face an anvil operatively mounted on an object to be rapped. A ball hammer is disposed within the guide tube and is arranged to be propelled against the anvil. A concentric outer tube surrounds the guide tube for a portion of its length to define an annular accumulator chamber therebetween. A diaphragm valve is operatively mounted on the lower end of the outer tube and is arranged to have a central portion of its upper face close the open lower end of the guide tube to prevent pressure in the accumulator chamber from entering the guide tube. A control chamber exposes the diaphragm to a

differential pressure to force the diaphragm to close the open lower end of the guide tube. Pressure in the control chamber may be selectively exhausted to flex and displace the diaphragm, such operation being effective to rapidly admit



pressure from the accumulator chamber to the guide tube to propel the ball hammer against the anvil and to impart an impact to the object. A recoil spring functions to absorb the reactive energy on the diaphragm as the ball hammer is propulsively accelerated toward the anvil.

3,831,687

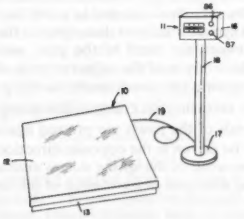
FLEXURE BASE SCALE

Doro Maffia, Santa Rosa, and Linus G. Schwartz, Ronnert Park, both of Calif., assignors to National Controls, Inc., Santa Rosa, Calif.

Division of Ser. No. 54,473, July 13, 1970. This application May 26, 1972, Ser. No. 257,449The portion of the term of this patent subsequent to May 30, 1989, has been disclaimed.

Int. Cl. G01g *3/14, 21/08*

U.S. Cl. 177—210 **5 Claims**



Scale in which force applied to a platform is transmitted to a transfer lever arm through flexure plates. In one embodiment, the transfer arm is connected to a load cell which produces an electrical signal which actuates digital means to provide a digital indication of the weight of an object on the platform. In other embodiments the transfer arm bears against a hydraulic load cell which is connected to a pressure gauge or digital display means for indicating the weight of an object on the platform.

3,831,688

SPRING BALANCE MECHANISM

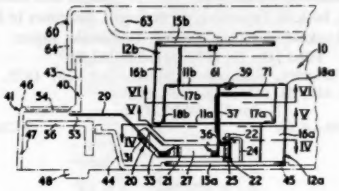
Dennis Phipps, Llanelli, Wales, assignor to Cambrian Housewares Limited, Staffordshire, England

Filed Mar. 21, 1973, Ser. No. 343,592

Claims priority, application Great Britain, Mar. 25, 1972, 14133/72

Int. Cl. G01g *3/08*

U.S. Cl. 177—229 **4 Claims**



A spring balance mechanism for weighing apparatus is built up in the form of a compact self-contained unitary assembly comprising a pair of similar L-shaped frame members in spaced inverted superposed relationship interconnected by parallel motion leaf spring members which are secured to flat step surfaces of the frame members. The top leaf spring member is rigidly connected along its length to a vertically depending elongate control arm of which the lower end abuts a weight indicator member pivotally mounted on the bottom frame member and thereby controls the movement of said indicator in accordance with load applied to the top frame member.

3,831,689

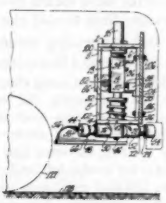
VEHICULAR ROAD SWEEP DEVICE

Charles H. Smith, 5215 Southall Ln., Bell, Calif. 90201

Filed May 7, 1973, Ser. No. 357,940

Int. Cl. E01h *10/00*

U.S. Cl. 180—1 R **7 Claims**



A vehicular road sweep device is provided for effectively engaging a wet, slippery road surface under rapid braking, emergency-type conditions to sweep water and other debris from the path of the vehicle's tires and thereby improve traction between the vehicle and the road surface. The device, comprising right and left-hand units, is adapted to be mounted to the vehicle anterior to each of the wheels and to be operated by a manual switch or a brake system switch. The device includes a linear assembly provided with a drive member having an upwardly extending guide member and downwardly extending coupling member. A longitudinally disposed connector rod is rotatably secured to the coupling member. A road engaging assembly is attached to the lower end portion of the connector rod. The road engaging assembly includes horizontally supported, limitedly rotatable, rotary means having pivot means and a road engaging member secured thereto. Means are provided for limitedly, axially and reciprocally rotating the connector rod; and means, respon-

sive to switch means, are provided for sequentially moving the drive member in downward and upward directions between predetermined upper and lower vertical positioning limits whereby the road engaging member is reciprocated between a raised, horizontal, inward, storage position and a lowered, vertical, outward, operative position.

3,831,690

TRACTOR DRIVING AND STEERING ARRANGEMENT

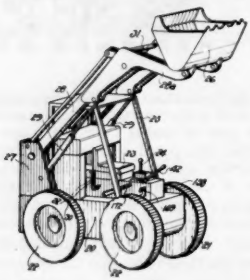
Kojiro Yamaoka, Nishinomiya; Toshiro Azuma, and Koichiro Fujisaki, both of Toyonaka, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Inadera, Amagasaki, Japan

Filed July 23, 1973, Ser. No. 381,897

Claims priority, application Japan, Oct. 26, 1972, 47/124219[U]; May 23, 1973, 48/60965

Int. Cl. B62d *11/06*

U.S. Cl. 180—6.66 **9 Claims**



A tractor comprising a pair of power transmitting means which connect engine output to left and right final drive means individually, each of said power transmitting means including a first fluid actuated clutch means for connecting said final drive means associated with said each of the power transmitting means to the engine output so as to drive the final drive means in forward direction and a second fluid actuated clutch means for connecting said final drive means associated with said each of the power transmitting means to the engine output so as to drive the final drive means in backward direction, a pair of control valve means having spools for controlling supply of pressure fluid to said clutch means, a single maneuvering lever, and connecting means connecting said lever and said spools and having a first connecting member for displacing both of said spools in a same direction and a second connecting member for displacing the spools in opposite directions. By manually operating said single maneuvering lever the left and right final drive means can be driven to rotate so as not only to stop, advance and retreat the tractor but to spin-turn the tractor to the left and right and further to turn the tractor to the left and right with an optional radius of turn by combining the operation of said maneuvering lever with manual operation of brakes for the final drive means.

3,831,691

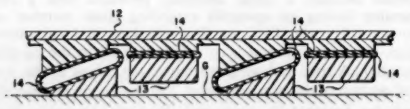
WALKING TREAD FOR AIR CUSHION VEHICLES

Dave H. Jenkins, Marietta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Los Angeles, Calif.

Filed Oct. 17, 1973, Ser. No. 407,317

Int. Cl. B60v *3/08*

U.S. Cl. 180—8 C **10 Claims**



This walking tread provides a means for moving a vehicle, e.g., an aircraft, equipped with an air cushion landing system without starting the aircraft's primary engines. The device can move the aircraft from parked position forward, backward, or turn it by the proper sequencing of the walking tread.

This device, which is attached to the bottom surface of longitudinal portions of the aircraft is basically a mat with crosswise rows of inflatable treads that alternately inflate and deflate to produce a walking motion. The treads are of three basic types - forward walking, stationary and aft walking. The internal surfaces of the walking treads are cut on an incline to impart a forward or backward motion by sliding down the inclined tread planes as the air pressure attempts to lift the aircraft.

This system is operated by compressed air from the aircraft's auxiliary power unit, therefore, the starting of the aircraft's primary engines is not required.

3,831,692

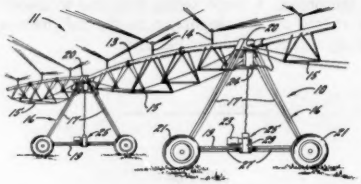
DRIVE TOWER FOR CIRCULAR IRRIGATION SYSTEM

Denton E. Fry, Fort Atkinson, Wis., assignor to Durst Corporation, Beloit, Wis.

Filed Oct. 17, 1972, Ser. No. 298,288

Int. Cl. B60k *7/02*

U.S. Cl. 180—14 R **6 Claims**



A drive tower for a circular irrigation system includes an upright frame for supporting a water pipe which extends radially from a central pivot. The frame is supported on wheels power rotated by an electric motor to drive the tower in a circular path around the pivot. To turn the wheels, the motor rotates a power shaft to reciprocate two pawls through alternating power strokes by means of two eccentrics each of which is mounted on the shaft and rotates within one of the pawls. As the pawls are alternately driven through their power strokes, they push against the teeth of a drive gear keyed to a drive shaft which connects to the wheels so that, as the pawls rotate the gear, the wheels are turned to move the tower. The pawls are shaped symmetrically so that either of their opposite ends may fit between the teeth of the gear, and reversible spring means selectively hold the adjacent ends of the pawls against the gear during the power stroke to drive the gear in one direction. By reversing the action of the spring means, the other adjacent ends of the pawls are pressed against the gear so the latter may be driven in the opposite direction. Solenoids controlling the reversal of the spring means enable an operator to reverse the direction of movement of the tower from a remote location.

3,831,693

STEERABLE ARTICULATION JOINT

James F. King, Cupertino, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

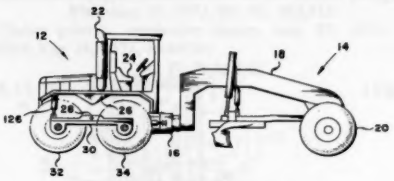
Filed Dec. 26, 1972, Ser. No. 318,540

Int. Cl. B62d *59/00*

U.S. Cl. 180—14 A **12 Claims**

A steerable articulation joint for effecting rapid connection of the two sections of a ground vehicle is shown. The joint has a first and second cylindrical support surface mounted con-

centrically from each other. The steerable articulation joint is connected to a steerable ground contacting member so that



pivotable movement of the articulation joint causes concurrent movement of the ground contacting member in the opposite direction of rotation.

3,831,694

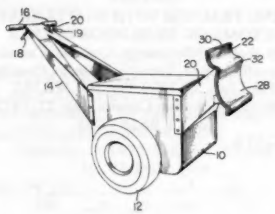
APPARATUS FOR MOVING VEHICLES AND THE LIKE

James MacKew, Fort Wayne, Ind., assignor to Power Wheels Corp., Ft. Wayne, Ind.

Filed Mar. 5, 1973, Ser. No. 338,149

Int. Cl. B62d *51/04*

U.S. Cl. 180—19 R **4 Claims**



A two wheeled vehicle-like apparatus for moving automobiles or the like, and which apparatus has a pair of ground wheels independantly rotatable on a common axis. An electric motor is provided for driving the wheels and battery means are provided in the apparatus for supplying power to the electric motor. A handle is fixed to one end of the frame of the apparatus and a lifting arm extends outwardly and upwardly from the other side of the frame and has vehicle engaging means on the other end thereof to exert a lifting force on the vehicle being moved, thereby to transfer weight from the vehicle to the wheels of the apparatus.

3,831,695

ALL-WHEEL DRIVE FOR MOTOR VEHICLES

Kurt Osterloff, Friedrichshafen-Manzell, and Georg Ruhrenschopf, Friedrichshafen, both of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

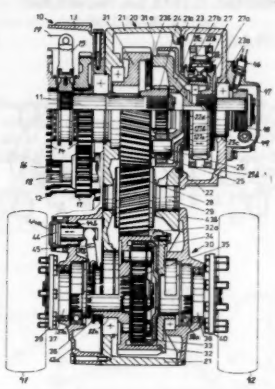
Filed Aug. 8, 1973, Ser. No. 386,498

Claims priority, application Germany, Aug. 8, 1972, 2238976

Int. Cl. B60k *17/04*

U.S. Cl. 180—44 R **10 Claims**

A planetary-gear train of an automotive transmission, in tandem with a speed changer of the shiftable-gear type, has a ring gear adapted to be locked either to an associated planet carrier or to a stationary housing to vary the speed ratio between the planet carrier and the driven shaft of the speed changer. The planet carrier is rigid with a spur gear driving the



drum of a differential gearing with two output shafts, one of the latter being selectively connectable with the housing to make the two output shafts run in unison.

3,831,696

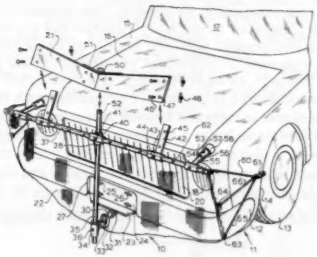
VEHICLE INSECT PROTECTION APPARATUS

Theodor H. Mittendorf, Mt. Dora, and Dale L. Bennett, P.O. Box 1138, Mt. Dora, both of Fla. 32757, assignors to said Mittendorf, by said Bennett

Filed Jan. 22, 1973, Ser. No. 325,318

Int. Cl. B60j *7/20*

U.S. Cl. 180—68 P **6 Claims**

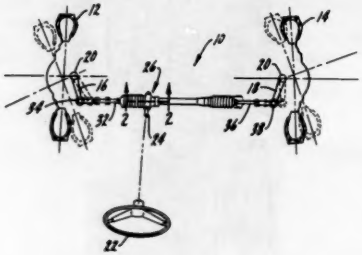


An insect protection apparatus for protecting moving vehicles from insects having a deflector shield for attachment to the front end of a vehicle for deflecting air currents and insects from the windshield of the vehicle and including a screen attached to the apparatus for covering an additional portion of the front end of a vehicle to catch insects to prevent the insects from hitting the front end of the car and getting into the vehicle radiator. The apparatus includes an easily attachable supporting system for the deflector shield and screen which is attached to the vehicle license plate holder and to the vehicle tire wells and having braces engaging the front end of the vehicle for ease in attaching and removing the apparatus from the vehicle.

3,831,697
RACK AND PINION POWER STEERING

Gunnar A. Wahlmark, Dixon, Ill., assignor to Wahlmark Systems, Inc., Chicago, Ill.

Filed Oct. 3, 1973, Ser. No. 403,201
Int. Cl. B62d *5/08*
U.S. Cl. 180—79.2 R **16 Claims**



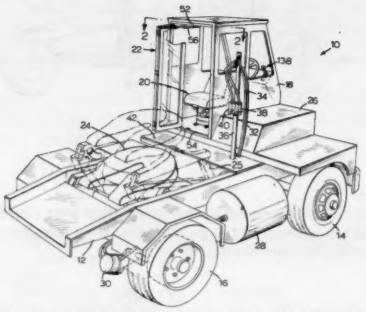
A power steering system integrated with conventional manual rack and pinion steering for an automotive vehicle. The system includes a housing in which are disposed a rack adapted to move rectilinearly along the axis of the housing and a pinion adapted to rotate in response to steering movements by a driver turning the vehicle's steering wheel. The rack engages the pinion so that rotation of the pinion moves the rack in conventional fashion. A pair of tie rods couple the rack to the vehicle's front left and right wheel steering mechanisms. A pair of piston heads fit snugly in the housing with one piston head attached to one end of the rack and the other piston head attached to the opposite end of the rack. The rack is received in the piston heads so that it can shift slightly in the vertical direction as the load on the rack changes due to changes in driving conditions. The power steering system has a steering valve which includes a body member with at least one groove therein and a sleeve having a plurality of openings therein. The sleeve fits snugly about the body member and the sleeve and body member are adapted to move relative to each other. Means are provided for moving the sleeve and body member, such means including a pair of follower elements which respond to rack and pinion movement. One follower element has one end connected to the body member and another end in frictional engagement with the pinion to move the body member in response to rotational movement of the pinion. The other follower element has one end connected to the sleeve and another end in frictional engagement with the rack to move the sleeve in response to axial movement of the rack. The system further includes a regulator for the steering pump in the form of a piston-like bearing member which tends to force the rack into engagement with the pinion, and regulates the hydraulic pressure produced by the pump by its up and down vertical movement as the load on the rack changes.

3,831,698
MOTOR VEHICLE BRAKE SYSTEM

John G. Fontaine, Fort Lauderdale, Fla., assignor to Fail Safe Brake Corporation, Ft. Lauderdale, Fla.

Division of Ser. No. 135,193, April 19, 1971. This application May 31, 1973, Ser. No. 365,433
Int. Cl. B60t *7/12*
U.S. Cl. 180—77 R **2 Claims**

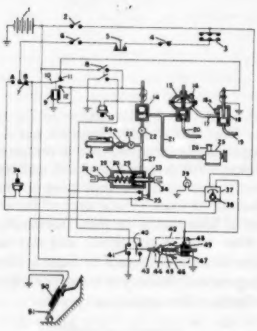
An Automatic Parking or Emergency brake system for motor vehicles comprising means by which the parking or emergency brakes of a motor vehicle will become applied automatically when the engine of the vehicle is shut off or stalls, and by which the brakes will become released automatically and immediately when the engine is started, and then only when the driver's seat is occupied and pressure exerted on the accelerator pedal. The described means includes also an arrangement by which, when the vehicle is halted at crossings and elsewhere on either level or hilly roadway, the parking or emergency brakes will be automatically applied within about three seconds after the vehicle comes to a complete stop and thus creeping of the vehicle is prevented, and this is particularly desirable when it is one of the automatic transmission type. The automatically-applied brakes may be released by depressing the accelerator pedal to operate a switch there.



3,831,699
SHUNTING TRACTOR WITH SWIVEL SEAT AND AUTOMATIC REAR DOOR OPENER

Karl Reinhold Wolter, Mississauga, Ontario, Canada, assignor to Levy-Russell Limited, Toronto, Ontario, Canada

Filed July 25, 1973, Ser. No. 382,353
Claims priority, application Canada, July 27, 1972, 148077
Int. Cl. B62d *53/08*
U.S. Cl. 180—77 S **13 Claims**

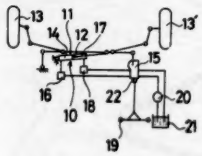


A shunting tractor is provided for moving road trailers. The tractor has a driving cap coupled to a chassis adjacent the front of the tractor and a fifth wheel is coupled to the chassis behind the cab by an adjustable support which is operable to raise and lower the fifth wheel for lifting the front of a road trailer. A swivel seat is mounted in the cab for rotation between a forward-facing first position and a rearward-facing second position and a cab door which is located at the rear of the cab adjacent a platform, is operably coupled to the seat. On moving the seat from the first to the second position the door opens to provide an operator with ready access onto the platform for coupling air services and the like to a trailer. The door returns to closed position upon returning the seat to the first position.

3,831,700
POWER STEERING MECHANISM

Akira Suzuki, Nishio, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Aichi, Japan

Filed Aug. 25, 1972, Ser. No. 283,718
Claims priority, application Japan, Aug. 25, 1971, 46-64933; Aug. 26, 1971, 46-65364
Int. Cl. B62d *5/08*
U.S. Cl. 180—79.2 R **4 Claims**

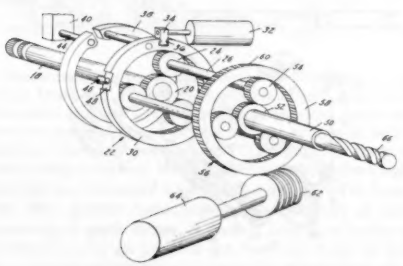


A power steering mechanism including an actuator having two actuating chambers operatively connected to vehicle wheels, a changeover control valve for alternatively connecting one actuating chamber to a pump and for connecting the other actuating chamber to a reservoir depending upon the direction of rotation of the steering wheel. A reaction means transmits a rotating resistance to the steering wheel in accordance with the discharging pressure of the pump, while various means are disposed within the connecting passageway for controlling the flow of fluid in an amount which is proportional to the vehicle speed, whereby the sudden restoration of the steering wheel, when the vehicle is running at a high rate of speed, is prevented.

3,831,701
POWER STEERING GEAR ACTUATOR

Howard M. Pilon, Allen Park; Sven W. Sattavara, Detroit, and Michael M. Schechter, Oak Park, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 7, 1972, Ser. No. 312,995
Int. Cl. B62d *5/06*
U.S. Cl. 180—79.2 R **8 Claims**

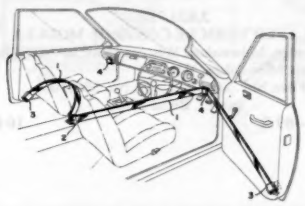


This disclosure relates to a power steering gear, and more particularly to a gear actuator constructed to be controlled both manually and by a source responsive to an external condition such as the lateral force produced upon a vehicle by a cross wind. In accordance with one embodiment, a steering gear actuator has first and second planetary gear sets with an input shaft connected to the sun gear of the first set. The ring gear of the first set is coupled to a power steering valve. The planet gears of the first set are coupled to the planet gears of the second set. An output shaft is connected to both the sun gear of the second set and the ball nut of a power boosted steering gear. An electric motor has a worm gear engaging the ring gear of the second set. The motor is adapted to be actuated by an external system such as a system constructed to produce a signal in response to a lateral force upon the vehicle resulting from a cross wind. Thus, in this embodiment a steering gear actuator is provided having both a manual input and a system operated input. The two planetary gear sets move in response to the two inputs and provide a composite output for actuating the steering gear.

3,831,702
SAFETY BELT DEVICE

Yuichiro Kaneko, Nagoya; Fuminori Teraoka, Konan; Tatsushi Kubota, Heguri-gun, and Takehiko Nishikawa, Inazawa, all of Japan, assignors to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, Nishikasugai-gun, Aichi-Pref, Japan

Filed Oct. 24, 1972, Ser. No. 299,808
Claims priority, application Japan, Oct. 25, 1971, 46-84475
Int. Cl. B60r *21/10*
U.S. Cl. 180—82 C **1 Claim**

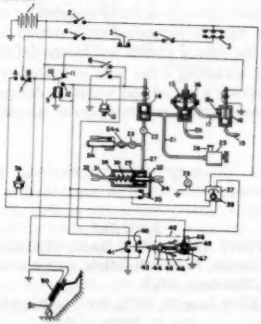


A safety belt device for use in vehicles, including a belt which is extended across a seat, with one end thereof fixed to the body of a vehicle and the other end connected to a retractor mounted in the door to be taken up therein and with the central portion thereof hooked on hook apparatus provided in front of the seat, a solenoid device to operate the hook apparatus to release the belt and a solenoid device operating circuit, the solenoid device being actuated by the operating circuit for a predetermined period of time when a passenger is seated on the seat and the door is closed, whereby said belt is automatically engaged around the body of the passenger.

3,831,703
AUTOMATIC PARKING OR EMERGENCY BRAKE SYSTEM FOR MOTOR VEHICLES

John G. Fontaine, Fort Lauderdale, Fla., assignor to Fail Safe Brake Corporation, Ft. Lauderdale, Fla.

Division of Ser. No. 135,193, April 19, 1971. This application May 31, 1973, Ser. No. 365,442
Int. Cl. B60t *7/12*
U.S. Cl. 180—82 R **4 Claims**



An Automatic Parking or Emergency Brake system for motor vehicles comprising means by which the parking or

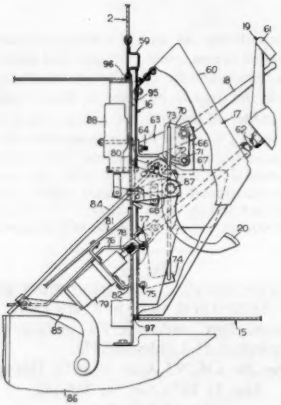
emergency brakes of a motor vehicle will become applied automatically when the engine of the vehicle is shut off or stalls, and by which the brakes will become released automatically and immediately when the engine is started, and then only when the driver's seat is occupied and pressure exerted on the accelerator pedal. The described means includes also an arrangement by which, when the vehicle is halted at crossings and elsewhere on either level or hilly roadway, the parking or emergency brakes will be automatically applied within about three seconds after the vehicle comes to a complete stop and thus creeping of the vehicle is prevented, and this is particularly desirable when it is one of the automatic transmission type.

3,831,704

ISOLATED VEHICLE CONTROL MODULE

Charles F. Zuege, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 20, 1972, Ser. No. 308,108
Int. Cl. B62d *27/04*
U.S. Cl. 180—89 R **10 Claims**



A vehicle having means defining an operator station including a control module supported on a shroud and resiliently mounted on the vehicle chassis and means defining an engine compartment including a fire wall in spaced relation to the shroud to provide a sound and vibration dampener between the engine compartment and the operator station.

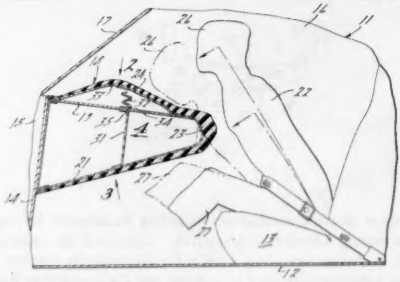
3,831,705

ENERGY ABSORBING DASH STRUCTURE

Patrick M. Glance, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed June 28, 1972, Ser. No. 266,916
Int. Cl. B60k *37/00*
U.S. Cl. 180—90 **4 Claims**

A two stage energy absorbing dash structure is adapted to be positioned in a motor vehicle compartment forwardly of the vehicle seating area. The dash structure has a chest impact zone and a head impact zone. The chest impact zone provides first stage dissipation of energy in decelerating a vehicle occupant during collision conditions and the head impact zone provides for a second stage of energy dissipation. The second



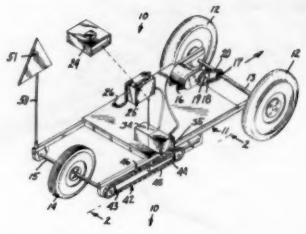
stage of energy dissipation may be enhanced by a knee impact zone of the dash structure. The dash structure includes at least one energy absorbing tension member extending between panels forming the dash structure to control the load deflection during energy absorption.

3,831,706

AUTOMATIC ROW MARKER APPARATUS

Clifford A. Nordine, Roosevelt, Minn. 56673

Filed Jan. 22, 1973, Ser. No. 325,642
Int. Cl. B62d *5/04*
U.S. Cl. 180—98 **11 Claims**



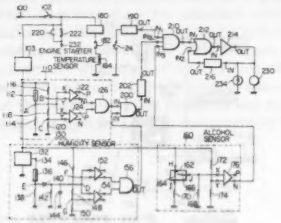
A pair of self-propelled vehicles are positioned in spaced apart alignment on a field to establish a line of sight for an operator along an initial path of travel of a manually operated powered farm implement. Each of the self-propelled vehicles includes an electrically driven motor connected to a source of power for imparting movement to the self-propelled vehicle. Electrical controls, including a control device, are provided for independently actuating the electrically driven motor of each of the self-powered vehicles, in a selected sequence to impart movement to the self-propelled vehicle in a direction perpendicular to the line of sight to establish a subsequent line of sight. A regulating device on each vehicle deactuates the motor to regulate the length of movement of the vehicle.

3,831,707

SYSTEM TO PREVENT DRUNKEN DRIVING

Yasuhisa Takeuchi, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokosuka, Japan

Filed Aug. 13, 1973, Ser. No. 387,651
Int. Cl. B60k 27/08
U.S. Cl. 180—99 16 Claims



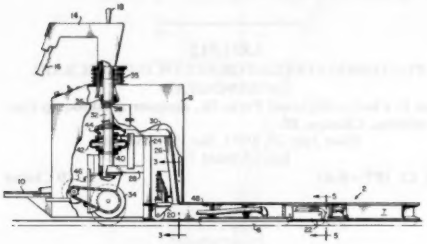
A device which tests a vehicle operator for drunkenness and prevents operation of the vehicle in response to a sensed drunken condition.

3,831,708

AIR FILM PALLET

Melvin D. Terry, 707 N. 188th, Seattle, Wash. 98133

Filed Nov. 1, 1972, Ser. No. 302,827
Int. Cl. B60v 1/00
U.S. Cl. 180—119 1 Claim



A powered, air film vehicle adapted for lifting exceptionally heavy loads and moving them with relatively little friction. The pallet includes a positive engagement drive wheel which controls the motion and direction of the vehicle as well as a guiding system at the opposite end of the pallet for controlling drift during movement. When in operation the entire weight of the objects to be moved is carried by a plurality of air bearings and other ground contacting means serve only as motion producing or guide means. A train of connected pallets may be moved by a single powered unit, however, it may be desirable to provide selectively activated guide wheels upon some or all of the pallets and a fixed direction auxiliary drive wheel may be utilized for lateral movement of the entire train.

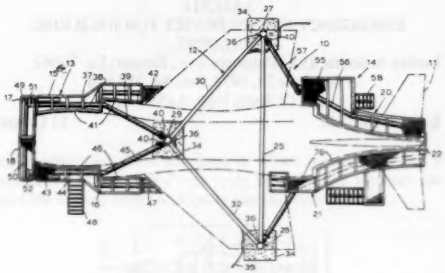
3,831,709

MOBILE AIRCRAFT SHORING AND MAINTENANCE DEVICE

Alan G. Stanford, Saint Augustine, and George A. Zutell, Jacksonville, both of Fla., assignors to Fairchild Industries Inc., Germantown, Md.

Filed Feb. 16, 1973, Ser. No. 333,121
Int. Cl. B60p 3/06; B60v 1/00
U.S. Cl. 180—125 11 Claims

A mobile aircraft shoring and maintenance device including a generally triangular shaped aircraft support structure and jacks connected to the support structure which are adapted to engage a portion of the underside of an aircraft to permit the aircraft to be mounted on the aircraft support structure. A forward scaffold structure is connectable to the aircraft support structure and the interior portion of the forward scaffold structure is shaped to generally conform to the exterior of the forward portion of the aircraft. An aft scaffold structure is also connectable to the aircraft support structure and the interior portion of the aft scaffold structure is shaped to generally conform to the exterior of the aft portion of the aircraft. Both the forward and aft scaffold structures have two sections that are locatable adjacent opposite sides of the aircraft and are pivotally connected to the aircraft support structure to permit the two sections to be pivoted outward away from the aircraft. Air cushion supports are located on the underside of the aircraft support structure that provide cushions of air which raise the aircraft support structure slightly and permit the aircraft support structure to be readily moved about.

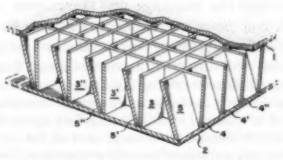


3,831,710

SOUND ABSORBING PANEL

Leslie S. Wirt, Newhall, Calif., assignor to Lockhead Aircraft Corporation, Burbank, Calif.

Filed Jan. 24, 1973, Ser. No. 326,508
Int. Cl. E04b 1/84
U.S. Cl. 181—33 G 13 Claims



A sound absorbing panel, generally comprising a honeycomb cellular layer, an impermeable backing enclosing one end of the cells, a permeable facing covering the other (open) end of the cells, and wherein adjacent cells are made to have a different resonant frequency. The adjacent, dissimilar, cells each have a predetermined difference in acoustic reactance and are acoustically in parallel. However, they do not act individually since their resonances combine in a useful way such that whichever cell is resonant dominates the acoustic behavior of the pair. The cell geometry is chosen such that one cell is at or near a resonance while the adjacent cell is at anti-resonance. The parallel system acts resonantly whenever either side is near resonance. As a result, sound ab-

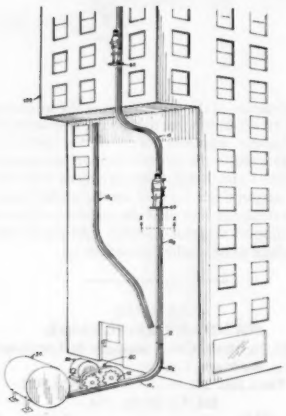
sorption remains high over a broad range of frequencies. The functional operation of the panel is relatively independent of the materials from which it is made and may, for example, be fabricated entirely from metal. It is particularly suitable for sound attenuation in jet engines and other applications having adverse environmental conditions, requiring sound absorptive panels, baffles, duct liners, and duct splitters.

3,831,711

EMERGENCY ESCAPE DEVICE FOR HIGH RISE BUILDING

Luther A. Smith, 1914 Delaware Ave., Kenner, La. 70062

Filed June 28, 1973, Ser. No. 374,676
Int. Cl. B66b 9/00; A62b 1/02
U.S. Cl. 182—40 **11 Claims**



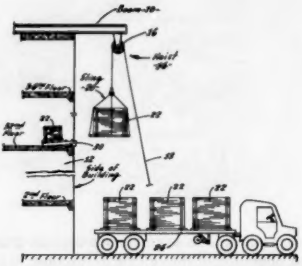
A transport or escape device, particularly adaptable for use in modern high rise buildings, and skyscrapers, as an escape route for use in the rescue of people who may be trapped and prevented from using the conventional stairways and elevators due to some injury, or natural or man-made disaster such as fire, elevator failure, building collapse, etc. The apparatus, or device, particularly useful as a fire escape, comprises the combination of a channel member installed upon the wall of a building which serves as a way, or rail for a roller chain, adapted to carry personnel escorts or carriers. The roller chain is meshed with a sprocket, or sprockets, powered by appropriate motor means such that the roller chain, provided with one or a plurality of personnel escorts or carriers fitted thereto via appropriate connecting means, can be guided and transported via the channel member, or rail, up the wall of the building from a lower level, e.g., ground level, to a higher level, e.g., the roof of the building, and then returned in similar manner. For example, empty personnel escorts can be conveyed to the roof of the building, loaded with people, and then returned to ground level. Suitably, the roller chain is stored upon a drum from which it can be unwound for use, and then rewound for storage. The channel member, or rail, is generally permanently mounted on a wall of the building, while other components can be either permanently mounted, or transportably mounted on a vehicle for use at different locations equipped with the channel members, or rails, installed prior to any emergency use requirement.

3,831,712

MECHANISM FOR TRANSPORTING LOADS INTO A HIGH RISE BUILDING

Tom D. Neely, 4080 W. 1st St., Santa Ana, Calif., and Jack M. Linneen, 8015 Highland Trl., Los Angeles, Calif. 90046

Filed Dec. 22, 1972, Ser. No. 317,633
Int. Cl. B66b 9/18
U.S. Cl. 187—2 **3 Claims**



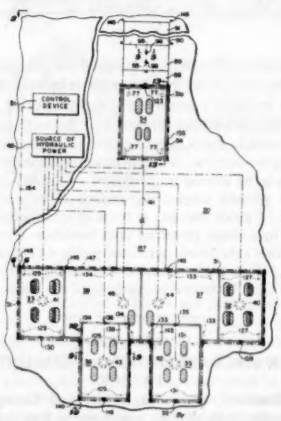
A mechanism is provided for loading heavy loads, such as bundles of wallboards, or other materials, into a multi-story high rise building. The mechanism includes a hoist which lifts the bundles directly from a truck to any floor of the building, and a portable inclined conveyor of a particular construction positioned on the floor on which the bundle is to be unloaded, the conveyor partially overhanging the edge of the building to receive the bundle from the hoist and to transfer the bundle into the interior of the building.

3,831,713

PLATFORM SYSTEM FOR SERVICING AIRCRAFT LANDING GEAR

Jesse E. Clarke, Highland Park, Ill., assignor to Autoquip Corporation, Chicago, Ill.

Filed July 20, 1971, Ser. No. 164,301
Int. Cl. B66f 7/00
U.S. Cl. 187—8.41 **10 Claims**



The floor of a servicing bay for large aircraft includes a plurality of wheel support platforms. There is a left wing gear platform, a right wing gear platform, two clearance platforms between the wing platform and each adjacent a respective wing gear platform, two body gear platforms extending rear-

wardly from the clearance platforms and a nose gear platform spaced forwardly from the two clearance platforms. The nose gear platform is on a scissors lift powered by a hydraulic ram. This scissors lift is on a carriage movable in a pit extending longitudinally of the aircraft. The remaining platforms are all supported on vertical hydraulic rams fixedly mounted approximately under the load centers of the respective platforms. Transfer sections are positioned between juxtaposed portions of the respective clearance platform and body gear platform. These transfer sections may be attached either to the clearance platform or the body gear platform and thus provide interchangeability to accommodate various types of aircraft. On each platform are a number of locks which engage vertically fixed portions adjacent the platform to prevent vertical movement of the platforms when the locks are engaged. The locks may be disengaged for vertical movement by the rams.

3,831,714

APPARATUS FOR MAINTAINING AN ELEVATOR CAGE IN THE VERTICAL POSITION

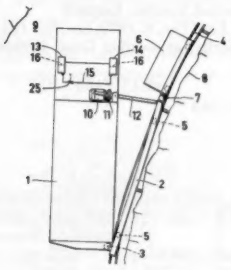
Jarl Hedman, and Tage Westerlund, both of Skelleftea, Sweden, assignors to Linden-Alimak AB, Skelleftea, Sweden

Filed Feb. 23, 1973, Ser. No. 335,411

Claims priority, application Sweden, Feb. 24, 1972, 2278/72

Int. Cl. B66b *9/06*

U.S. Cl. 187—12 **2 Claims**



This invention relates to a device for holding the cage of an elevator moving on a curved track in a vertical position. The device comprises adjustment means for holding the elevator cage in a vertical position, and an inclination transmitter, which scans the inclination of the elevator cage and controls the adjustment means.

3,831,715

ELEVATOR CONTROL PROCESS AND SYSTEM

Hideto Matsuzawa; Kikuo Watanabe, and Isao Inuzuka, all of Katsuta, Japan, assignors to Hitachi Ltd., Tokyo, Japan

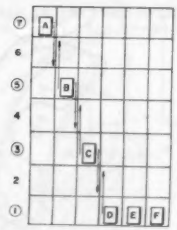
Filed Feb. 1, 1973, Ser. No. 328,677

Claims priority, application Japan, Feb. 2, 1972, 47-11392; Feb. 21, 1972, 47-17243; Mar. 8, 1972, 47-23209

Int. Cl. B66b *1/18*

U.S. Cl. 187—29 R **16 Claims**

A process and system for controlling a plurality of elevator cars servicing a plurality of service floor landings in which at least three specific floors are selected beside the basic floor where the number of passengers is largest so that some of these elevator cars can stand by at the basic floor and one of the elevator cars can stand by at each of the specific floors. The up and down hall call responding zones of each elevator car are determined so that it can respond to up and down hall calls originating from the floor at which the elevator car is situated and from the floors lying between this elevator car and the nearest upper and lower elevator cars.



3,831,716

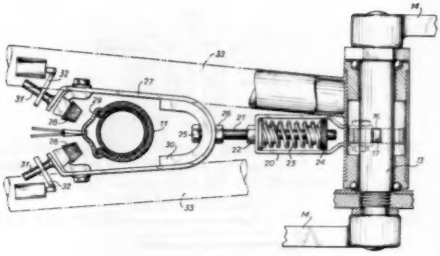
BICYCLE FOOT BRAKES

Hector Mendoza Orozco, Adolfo Prieto No. 1709, Col. del Valle, Mexico (12 D.F.)

Filed June 21, 1973, Ser. No. 372,114

Int. Cl. B62l *5/00*

U.S. Cl. 188—24 **3 Claims**



This invention relates to improvements in foot brakes for bicycles of the type that when turning the pedals in the direction opposite to forward, a mechanism is set in motion which prevents turning of one of the bicycle's wheels. This mechanism consists of lever including an annular portion coupled to the pedal and a lug pivotly fixed at one end of a guiding and joining structure which slidingly housed a portion of a bolt, the other portion of which is fixed to a yoke which is the brake as such.

3,831,717

MOTOR VEHICLE DISC BRAKE HAVING CALIPER RETAINING MEANS

Bernard M. Flaherty, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

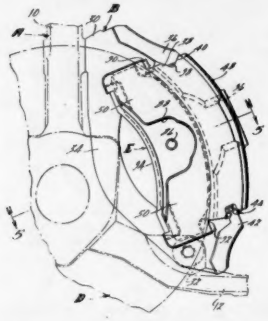
Continuation of Ser. No. 159,378, July 2, 1971, abandoned. This application July 2, 1973, Ser. No. 375,996

Int. Cl. F16d *65/02*

U.S. Cl. 188—73.3 **14 Claims**

A disc brake for a motor vehicle having an anchor plate secured to a wheel support member. A brake caliper is slidably supported on the anchor plate and straddles a brake rotor. The caliper is constructed to urge a pair of brake shoes into engagement with the braking surfaces of the brake rotor.

A unique releasable retaining means secures the caliper to the anchor. In the presently preferred embodiment, the caliper



and anchor have interfitting tongue and groove portions. The retaining means comprises spring metal retaining clip interposed between the tongue and groove portions.

3,831,718

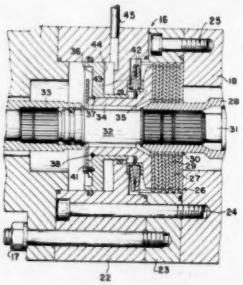
PARKING BRAKE ASSEMBLY FOR TRACK-TYPE VEHICLES

Thomas P. Muller, Aurora, and Ellis A. Sitton, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 24, 1972, Ser. No. 309,283

Int. Cl. F16d *65/24*

U.S. Cl. 188—170 **11 Claims**



The final drive for a track-type vehicle comprises a speed reduction gear train operatively connectible to a hydrostatic drive motor to drive a track engaging sprocket. A parking brake assembly is mounted between the motor and gear train and comprises a piston adapted to disengage the brake by directly engaging a snap ring mounted in an annular groove formed on a reciprocal hub. The hub has a pressure plate secured thereon which, in turn, releases spring-biased friction discs upon disengagement of the brake. A radially disposed end plate is attached to the piston to abut an end of the hub to prevent dislodgement of the snap ring.

3,831,719

BRAKE WEAR COMPENSATION USING THREADED WEDGE INTERLOCK

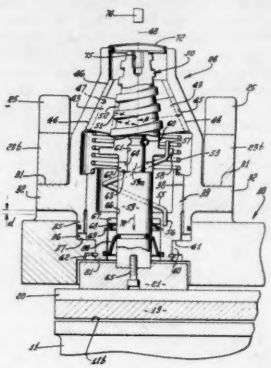
Samuel J. Martins, Reseda, Calif., assignor to Airheart Products, Inc., Chatsworth, Calif.

Filed Jan. 8, 1973, Ser. No. 321,708

Int. Cl. F16d *65/56*

U.S. Cl. 188—196 F **16 Claims**

Brake part advancing and wear compensation apparatus includes a lever actuated anvil engaged by wedge means, there being a rotary shaft having rotary cam engagement with the wedge means. The shaft transmits braking force from the anvil and wedge means to the brake part, as via a non-rotary stem



subject to retraction by an energizable Belleville spring. A torsion spring tends to rotate the shaft relative to the wedge means, maintaining tight coupling between the anvil and shaft in spite of brake part wear.

3,831,720

DRUM BRAKE ACTUATORS

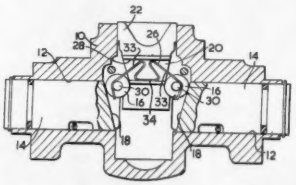
Malcolm Clarence Williams, Caerleon, Wales, assignor to Girling Limited, London, England

Filed Dec. 8, 1972, Ser. No. 313,523

Claims priority, application Great Britain, Dec. 10, 1971, 57414/71

Int. Cl. F16d *51/18*

U.S. Cl. 188—343 **7 Claims**



A drum brake roller expander actuator has a wedge member for outwardly displacing a pair of opposed tappets and a pair of spaced parallel rollers, each arranged between a respective tappet and an inclined face of the wedge member. The rollers are coupled to and located relative to the wedge member by resilient retainer means carried by the wedge member and engaging the ends of the rollers.

3,831,721

DUMP VALVE AND FORWARD-REVERSE DRIVE CONTROL EMPLOYING SAME

Daniel B. Shore, Niles, Ill., assignor to International Harvester Company, Chicago, Ill.

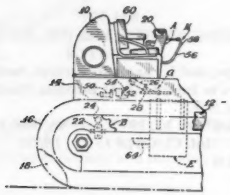
Continuation of Ser. No. 689,549, Dec. 11, 1967, Pat. No. 3,458,018. This application Jan. 23, 1969, Ser. No. 818,857The portion of the term of this patent subsequent to July 29, 1986, has been disclaimed.

Int. Cl. B60k *29/02*

U.S. Cl. 192—4 C **1 Claim**

Tractor having dump valve and forward-reverse drive control employing same, effective to automatically brake the trac-

tor when the tractor's direction of motion is to be reversed. The tractor has brakes and a reversible transmission controlled by the dump valve, a run detector pump to sense direction of rolling movement of the tractor and having a directionalized pump output, and a range selector valve having a control portion. By suitable interaction with the other components, the dump valve receives against pressure movable end areas thereof an output from the range selector valve and directs control pressure to operate the brakes and transmission in alternation to one another. More specifically, the dump valve: receives against the pressure movable end areas



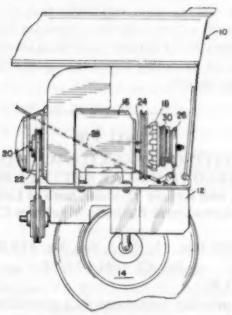
the directionalized pump output so as to be hydraulically balanced in a centered position operating the tractor with transmission engaged and brakes disengaged; receives against the pressure movable end areas an unbalancing force from the range selector valve control portion (due to reversal of the range valve position) causing the dump valve to shift off center and dump, neutralizing the transmission and setting the brakes; and having valve springs effective to mechanically rebalance the dump valve attendant with slow down of the run detector pump, causing the dump valve to recenter, releasing the brakes and engaging the transmission in an opposite drive setting.

3,831,722

INDEPENDENT POWER TAKE OFF CLUTCH BRAKE

Joseph P. Deschamps, Naperville, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Sept. 27, 1972, Ser. No. 292,584
Int. Cl. F16d *67/02*
U.S. Cl. 192—18 R **1 Claim**



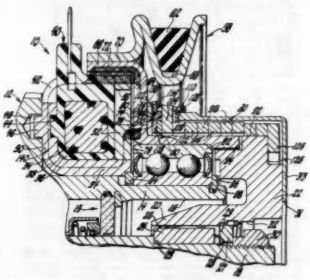
A brake and disengagement assembly for a clutch mechanism which is pivotally connected to the actuation lever such that input forces are evenly distributed.

3,831,723

ELECTROMAGNETIC SPRING-WOUND CLUTCH

John R. Briar, Dayton, and Frederick M. Grabek, Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 18, 1973, Ser. No. 352,089
Int. Cl. F16d *27/10*
U.S. Cl. 192—35 **7 Claims**



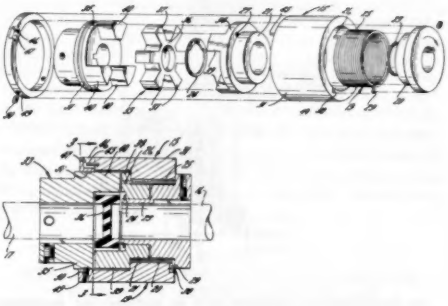
An improved electromagnetic spring-wound clutch wherein a pair of cooperating clutch armature discs are drawn into contact with a rotating input pole member to cause a pair of interthreaded coil springs to grippingly engage axially aligned driving and driven members in a balanced manner at oppositely disposed sides thereof.

3,831,724

CLUTCH AND COUPLING UNIT

John S. Baer, Bar Harbor, Maine, assignor to Warner Electric Brake & Clutch Company, South Beloit, Ill.

Filed Nov. 6, 1972, Ser. No. 304,089
Int. Cl. F16d *43/20*
U.S. Cl. 192—56 C **8 Claims**



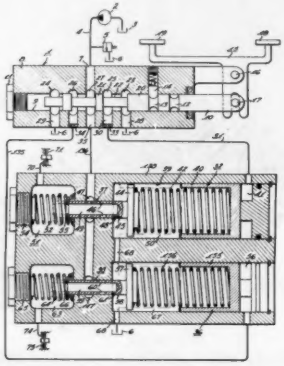
Power is transmitted between driving and driven shafts by way of a normally engaged helical spring clutch and a torsionally yieldable coupling. When a torque overload is exerted on the driven shaft, the resulting torsional deflection of the coupling is used to release the clutch.

3,831,725

HYDRAULIC CLUTCH PRESSURE MODULATOR

Robert E. Schott, New Berlin, Wis., assignor to Allis-Chalmers Corp., Milwaukee, Wis.

Filed Dec. 18, 1972, Ser. No. 316,364
Int. Cl. F16d 25/10
U.S. Cl. 192—87.13 10 Claims



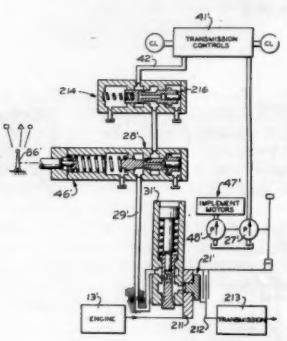
A pressure modulator for a hydraulic valve to modulate the pressure of the hydraulic fluid supplied to two clutches as the transmission of power is transferred from one clutch to another.

3,831,726

DRIVE TRAIN WITH CONTROLLED SLIPPING CLUTCH

Albert L. Woody, Peoria; Sidney J. Audiffred, and Howard C. Steury, both of Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 86,793, Nov. 4, 1970, abandoned.
This application Nov. 7, 1972, Ser. No. 304,492
Int. Cl. F16d 23/00
U.S. Cl. 192—103 FA 7 Claims



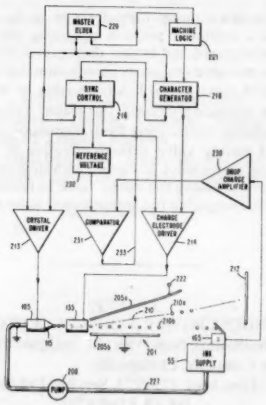
A drive train for vehicles such as earthmoving machines having a prime mover coupled in driving relation with ground wheels for the machine through a power input member and a power output member. One or more implements are coupled to the power input member. In order to selectively match or mismatch power delivered by the prime mover with varying power requirements for the implements and wheels, a hydraulically operated slipping clutch is arranged between the power input and output members for adjusting power delivery from the prime mover to the output member and wheels with a manual control for regulating hydraulic operation of the slipping clutch. In other embodiments, the power input and output members are portions of a torque converter, a centrifugal valve also being provided to operate the slipping clutch in response to rotational speed of an element in the drive train and under regulation of the manual control. Another embodiment includes the slipping clutch disposed in a fluid housing subject to variable pressure with the centrifugal valve being responsive to the variable fluid pressure. In another embodiment, controls for a transmission in the drive train are also operative to provide regulation of the slipping clutch.

3,831,727

PRESSURIZING SYSTEM FOR INK JET PRINTING APPARATUS

Harry R. Kruspe, and N. Kenneth Perkins, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1972, Ser. No. 308,365
Int. Cl. G01d 15/18, 18/00
U.S. Cl. 197—1 R 6 Claims



A pressurizing system for an ink jet printer is described that is mounted on a movable carrier, the carrier having an associated nozzle, charge ring, and deflection plates for generating information on a character-by-character basis or on a line-by-line basis, the carrier further including an ink supply reservoir and the entire assembly constituting an efficient structure operable at high speeds.

3,831,728

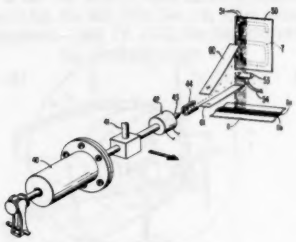
INK JET PRINTING APPARATUS WITH OVERRUN OF PRINTHEAD TO INSURE BETTER VISIBILITY

Joe W. Woods, and Krikor Yosmali, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1972, Ser. No. 313,886
Int. Cl. G01d 15/18
U.S. Cl. 197—1 R 3 Claims

An ink jet printing apparatus has provision for both line printing and character-by-character printing. A directionally oriented grating and associated circuitry is provided to maintain a record of character and ink drop printing locations. Also, provision is made for over-shooting the printhead some distance past each character printed during an incremental

mode and for stopping the printhead to enable better visibility of the character just printed. Upon printing of the next



character, the printhead first moves to the left a sufficient distance to get past the character box to be printed and sweeps to the right with the overshoot and stopping as before.

3,831,729

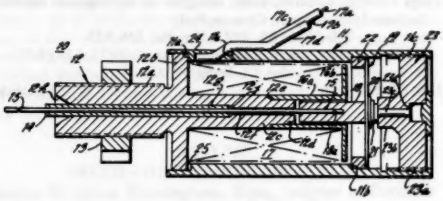
SOLENOID HAVING INCREASED THROW CAPABILITY

Robert Howard, Roslyn, N.Y., assignor to Centronics Data Computer Corp., Hudson, N.H.

Continuation-in-part of Ser. No. 203,230, Nov. 30, 1971, abandoned. This application Jan. 10, 1973, Ser. No. 322,298

Int. Cl. B41j *3/10*

U.S. Cl. 197—1 R **14 Claims**



A solenoid for actuating a print wire normally biased against the impact direction by novel spiral spring means. Energization of the solenoid coil rapidly moves the print wire in the impact direction against the bias of the spring. Release of the energy supplied to the solenoid coil causes very rapid return of the print wire to the non-printing (i.e., quiescent) position. The novel spiral spring structure experiences a substantially linear spring force upon deflection and provides significantly increased deflection as compared with conventional structures to allow for substantially rapid initial acceleration of the print wire in the impact direction while providing for rapid return of the print wire to the quiescent condition. The mounting of said spring reduces bouncing on overshooting.

3,831,730

KEYBOARDS

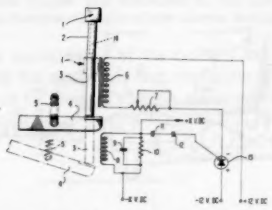
Douglas F. Koeppe, 924 W. Ave. F, Kingsville, Tex. 78363

Filed Jan. 31, 1973, Ser. No. 328,239

Int. Cl. B41j *5/08*

U.S. Cl. 197—98 **5 Claims**

Keys of a typewriter or similar machine embodying a keyboard are returned to their elevated inactive positions by a force greater than the force utilized to support the keys in their elevated positions. The increased return force may be derived from the operation of electromagnetic means. The invention causes the fingers of the keyboard operator to "boun-



ce" to an advantageous position above the keyboard where they are poised for a more rapid and efficient continuing keyboard operation.

3,831,731

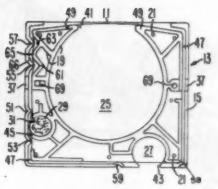
SELF-TENSIONING AND RE-INKING RIBBON CARTRIDGE FOR ENDLESS RIBBONS

Ronald H. Mack, and John Bortins, both of Plymouth, Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 27, 1972, Ser. No. 301,641

Int. Cl. B41j *33/10*

U.S. Cl. 197—168 **15 Claims**



A ribbon cartridge having self-contained tensioning and re-inking means is provided with a plurality of cylindrical interior compartments effective for receiving the print wheel and a friction feed roller of an impacting printing device, the cartridge being removably attachable to the printing device by means of a supporting platform such that the print wheel is operably disposed within a first of said cylindrical compartments and the friction feed roller is operably disposed within a second of said compartments, the self-tensioning means of the cartridge serving to hold the ribbon in a taut state in a printing position adjacent the print wheel and to hold the ribbon in frictional contact with a cylindrical re-inking member disposed in a third cylindrical compartment. The inked ribbon in the form of an endless loop is movably disposed within an interior peripheral channel formed in the cartridge and communicating with discontinuities formed in the walls of each of the three cylindrical compartments, the self-tensioning means being comprised of a plurality of ridge-like deformations formed in the channel.

3,831,732

APPARATUS FOR HANDLING AND TRANSPORTING CYLINDRICAL ARTICLES AND THE LIKE

Harvey A. Spies, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

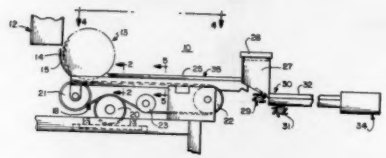
Filed Nov. 16, 1971, Ser. No. 199,269

Int. Cl. B65g *47/00*

U.S. Cl. 198—20 R **23 Claims**

A device for handling and transporting substantially cylindrical elongated objects between a supply station and a work station, such as a wrapping or packaging station, is described.

An intermediate storage means is provided to temporarily store objects in the event that the rate of packaging of said objects falls below the rate of supplying said objects to the transport means. This enables the packaging operation to be shut down without affecting the supply or manufacturing rate of said objects.

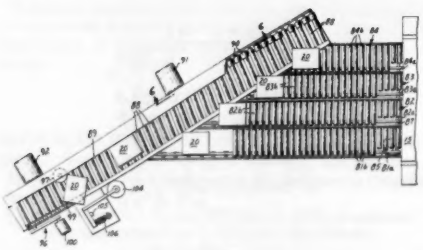


3,831,733

DESTACKING APPARATUS

Richard W. Howard, Forest Lake Township, Wash. County, and Roman J. Weier, North Saint Paul, both of Minn., assignors to Wyard Industries, Inc., Forest Lake, Minn.

Filed Oct. 24, 1972, Ser. No. 299,948
Int. Cl. B65g *47/31*
U.S. Cl. 198—32 **5 Claims**



An apparatus for the destacking of containers arranged in a plurality of stacked tiers, each tier containing a plurality of said containers. The apparatus lifts the stack to a position where the top tier is held in place while the stack is again lowered. A plate is placed under the separated tier of containers, the tier is then released to the plate and the plate is moved out of the path of the stack. The separated tier is then moved onto a conveyor. The containers as they move onto the conveyor are separated and directed to a transversely moving conveyor in spaced relation where they are oriented with the containers all spaced and all of the containers in the same position.

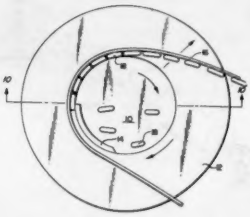
3,831,734

CENTRIFUGAL METHOD OF SORTING PARTICULATE ARTICLES

Kurt H. Hoppmann, Falls Church, Va.; George W. Edmunds, Derwood, Md., and Horst A. Schober, Falls Church, Va., assignors to Hoppman Corporation, Springfield, Va.

Filed Mar. 26, 1973, Ser. No. 344,696
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AA **9 Claims**

High speed feeding, counting, orienting and storing of small parts such as candy, machine screws and nuts, ammunition, pills and the like. The articles are accelerated and centrifugally distributed in single file alignment upon a rotating inner plane, then discharged upon an inclined stationary ramp which delivers the articles in single file alignment to a rotating outer plane. The articles are spaced longitudinally by guiding or restraining the articles during their radial discharge from the rotating outer plane. The articles may be stored in reservoirs at the periphery of the outer plane. Modifications of invention include variously configuring rotating planes and guiding wall, pivoting the articles during their discharge so as to advance their center of gravity radially outwardly and vertically orienting the articles by gravity drop feeding in a reservoir at the periphery of the outer rim.

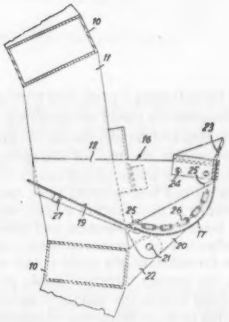


3,831,735

BULK MATERIAL BLENDING AND RECLAIMING APPARATUS

Luigi Canella, Genova, Italy, assignor to Italimpianti Societa Italiana Impianti p.a., Genova, Italy

Filed Feb. 28, 1973, Ser. No. 336,525
Claims priority, application Italy, Mar. 4, 1972, 12515/72
Int. Cl. B65g *59/02*
U.S. Cl. 198—36 **3 Claims**



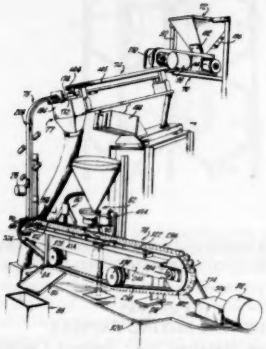
A reclaiming apparatus comprising a rotatable drum formed by a cage-like frame structure, the said drum being movable relative to a storage pile of particulate raw material. A number of buckets are secured to the cage-like drum. The buckets are disposed in parallel rows extending along the whole length of the drum, the said rows being equiangularly spaced along the drum periphery. Conveyor means are provided inside of the drum for conveying outside of the drum the particulate material discharged into the drum by the said buckets during the operation of the reclaiming apparatus.

3,831,736

POWER DRIVEN MAGNETIC CONVEYOR

Gerald Barnes, South Orange, N.J., assignor to Amerace Esna Corporation, New York, N.Y.

Division of Ser. No. 30,817, April 22, 1970, which is a continuation of Ser. No. 605,769, Dec. 29, 1966, abandoned.
This application July 10, 1972, Ser. No. 270,191
Int. Cl. B65g 17/46
U.S. Cl. 198—41 2 Claims



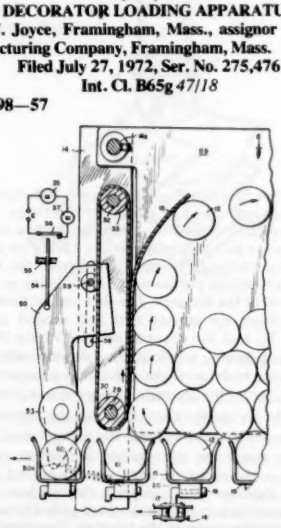
A magnetic conveyor is provided including a plurality of holding fixtures for articles of magnetic material. The fixtures are adapted to be mounted on a power driven endless belt in relatively close proximity. Each holding fixture utilizes a permanent magnet plate disposed between flat magnetic pole pieces, all of which are adapted to be sandwiched between a pair of non-magnetic members. The permanent magnet plate retains a cylindrically shaped article of magnetic material in position within opposed and aligned notches, which latter are provided in the non-magnetic member and extend below the top face of the pole pieces.

3,831,737

DECORATOR LOADING APPARATUS

Arthur W. Joyce, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed July 27, 1972, Ser. No. 275,476
Int. Cl. B65g 47/18
U.S. Cl. 198—57 3 Claims



Decorator loading apparatus for loading tubes or the like into carriers. The loader includes a hopper into which the tubes are initially loaded and thereafter dispensed into tube carriers passing below the open bottom of the hopper. The tubes are either kicked vertically upwards against a deflector positioned in the hopper and deflected to the rear of the hopper or urged downwardly into a tube carrier moving below the hopper.

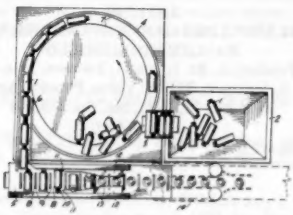
The above is accomplished by the use of a moving belt which preferably has a relatively high coefficient of friction and which acts on the tubes. In addition, sensor means is provided for detecting out of position tubes to turn off the apparatus to avoid jamming.

3,831,738

BOTTLE ORIENTATION APPARATUS

Samuel S. Aidlin, Brooklyn; Stephen H. Aidlin, Valley Stream; Melvin Hartzog, Brooklyn, and John C. Shepard, Jamaica, all of N.Y., assignors to Aidlin Automation Incorporated, New York, N.Y.

Filed Aug. 1, 1973, Ser. No. 384,517
Int. Cl. B65g 47/24
U.S. Cl. 198—33 AC 12 Claims



A bottle orientation apparatus for use with an endless conveyor belt, adapted to receive bottles in a horizontal position from a source of supply. The apparatus is provided with a pair of cooperatively acting orientators each of which is disposed on either side of the belt, and formed of two integral guide members. The bottles being conveyed are engaged at the neck by a sloping, generally elongated, first guide member so as to provide the initial uplift to the bottle. The bottle, as it is being conveyed, is next urged into contact with a second guide member having a "V" shaped opening and continuously associated wall surfaces forming a channel for the final orientation of the bottle into the erect position.

3,831,739

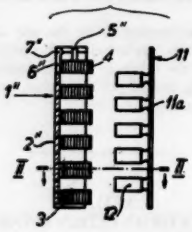
MAGAZINE OR CONTAINER FOR RECEIVING ARTICLES SUCH AS CASELESS PROPELLANT CHARGES OR COMPACTS

Manfred Hartmann, Frastanz, Austria, assignor to Hilti Aktiengesellschaft

Continuation of Ser. No. 16,878, March 5, 1970, abandoned.
This application Aug. 31, 1972, Ser. No. 285,478
Claims priority, application Germany, Mar. 17, 1969, 1913500
Int. Cl. B65d 85/02; F42b 37/00
U.S. Cl. 206—3 2 Claims

A magazine or container for receiving articles such as caseless propellant charges or compacts includes a tubular member having an internal diameter corresponding substantially to the diameter of the articles which are to be stored therein. The tubular member includes an end which is slotted to form segmental portions which may be deflected outwardly

for removing the articles out this end. The container includes a rake element which is inserted into an elongated slot in the



side of the container and which provides individual spacer elements for maintaining a plurality of said propellant compacts in axially spaced relationship within said container.

3,831,740

OVER THE SHOULDER GARMENT CARRIER BAG WITH HANGER HOOK SHIELD

Lewis A. Pendergast, Rt. 1, Box 31, Tolleson, Ariz. 85353, and Charles K. Sorensen, 3832 E. Yucca, Phoenix, Ariz. 85028

Filed July 21, 1972, Ser. No. 273,944

Int. Cl. B65d *85/18*

U.S. Cl. 206—7 K 8 Claims

Over the shoulder garment carrier comprising a garment bag having a collar-type shield for covering the hook end of a suit hanger when the weight of the garment in the carrier is supported by the hook end of the hanger.

3,831,741

EXTRUDED PLASTIC CONTAINER CARRIER STOCK AND METHODS FOR PRODUCING THE SAME

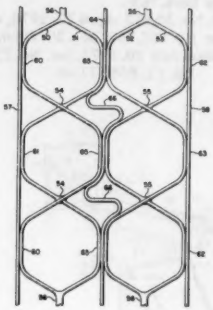
Ougljesa Jules Poupitch, La Jolla, Calif., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed May 5, 1972, Ser. No. 250,535

Int. Cl. B65d *71/00*; B66f *19/00*; D01d *11/00*

U.S. Cl. 206—150 4 Claims

Multiple container carrier stock comprising strands of a resilient and deformable plastic material that has been extruded and fused in the molten or semi-molten state to form integral stretchable bands. The fusion joints have smooth curvilinear surfaces void of sharp corners. Similarly formed



strands provide a handle and outer side rails. The carrier is applied to a plurality of cylindrical containers to form a package.

3,831,742

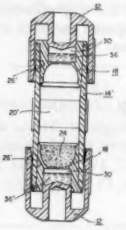
DENTAL MIXING CAPSULE

John M. Gardella, Matawan, N.J.; Anthony Ciavattoni, New Drop, N.Y., and Robert Albert Kiefer, Toms River, N.J., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 16, 1972, Ser. No. 298,077

Int. Cl. B65d *81/32*

U.S. Cl. 206—219 7 Claims

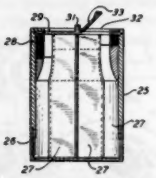


A capsule has a hollow body defining a first compartment having an open end which is closed by a retainer, the latter being telescopically mounted within the hollow body. The retainer defines a second compartment having an open end, the second compartment being isolated from the first compartment by a frangible partition, the latter being an integrally molded portion of the retainer. The first and second compartments are utilized for storing first and second ingredients respectively. To seal the second material within the second chamber, a cap having a plunger is telescopically mounted over the capsule body, with the end of the plunger extending into the open end of the second chamber in a sealing relationship therewith. To use the capsule to mix the ingredients, it is compressed endwise so as to force the plunger inwardly to increase the pressure on the second ingredient (preferably liquid), rupture the partition, and eject the second ingredient into the first chamber. The capsule is then shaken to mix the ingredients, and the cap and retainer are pulled from the body as a unit to provide access to the mixture. The capsule may be compressed by hand alone or with the assistance of a special tool.

3,831,743
SELECTABLE MULTI-COMPARTMENT MAGNETIC DISPENSER

Robert M. Leedy, 7 Martindale Rd., Short Hills, N.J. 07078

Filed Dec. 26, 1972, Ser. No. 317,931
Int. Cl. B65d *83/00*; A45c *11/00*
U.S. Cl. 206—338 2 Claims



A dispensing container for magnetizable articles, such as clips, nails, nuts, bolts and similar metallic articles, is provided wherein such container has a plurality of compartments for housing magnetizable articles of different types or sizes, and which are retained by a magnet disposed adjacent an outlet opening of each compartment, so that all housed articles may be selectively removed by the user as desired. Such container may also be provided with a movable top which closes the outlet opening of all compartments except the one selected by the user for removal of a particular desired magnetizable article.

3,831,744
CONTAINERS

Rex Keith Walden, Hertford; Arthur Henry Tompkins, and Harold Abraham Ross, both of London, all of England, assignors to Ross Bros. (London) Limited, London, England

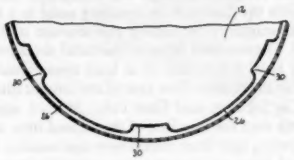
Filed Oct. 27, 1972, Ser. No. 301,443
Claims priority, application Great Britain, Oct. 29, 1971, 50496/71
Int. Cl. B65d *19/20*
U.S. Cl. 206—386 3 Claims

A container for goods is disclosed, wherein the bottom of the container on which the goods are to rest comprises at least two superimposed layers of material and wherein there are provided a plurality of supports to space the bottom of the container from the ground, each of which supports comprises a first part sandwiched between the two layers and a second part disposed beneath the lower of the two layers, which parts are connected by another part which projects through an aperture in the said lower layer. The other part may be integral with either the first part or the second part, and the second parts of the supports may be interconnected by spacing means outside the container.

3,831,745
CONTAINER WHICH IS NESTABLE WITHOUT STICKING

John H. Rump, Lisle, and Joseph E. Smith, Palos Hills, both of Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 24, 1971, Ser. No. 201,873
Int. Cl. B65d *21/02*
U.S. Cl. 206—520 6 Claims

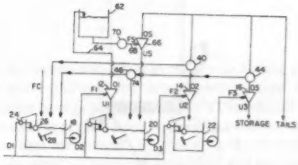


A nestable, cup-like container having special circumferentially extending stacking means formed in its sidewall which includes two sets of inwardly extending supporting projections, each set being intermediate the other, one set extending inwardly further than the other and serving as the primary means of support of a similar container when nested therein, whereas the other set serves as a secondary means of support for such a similar container.

3,831,746
RECOVERING FILTER AID PARTICLES FROM FILTER CAKE

Peter C. Wilson, P.O. Box 561, Evergreen, Colo. 80439, and Robert P. Hughart, 9451 E. Grand St., Englewood, Colo. 80110

Continuation-in-part of Ser. No. 838,826, July 3, 1969, abandoned. This application Aug. 2, 1971, Ser. No. 168,277
Int. Cl. B03b *9/00*
U.S. Cl. 209—2 5 Claims



A method of recovering filter aid particles from a filter cake and the reuse of filter aid particles reclaimed from a filter cake. The method of recovering filter aid particles involves separating from a diluted filter cake a substantial part of the filter aid particles by centrifuging the material, sequentially, in a plurality of spiral paths at a force varying between approximately 250–7000 times the force of gravity, while producing a vortex of gradually and constantly decreasing diameter and, prior to each separating step, diluting the filter cake by adding a liquid thereto and agitating and intermixing said material until the filter cake is substantially uniformly distributed throughout the liquid whereby substantially all of the filter aid particles are subjected to the cleansing action of said liquid. The method of recovering filter aid particles also involves the spinning of diluted filter cake, sequentially, in a plurality of paths to produce a vortex of gradually and constantly decreasing diameter at a velocity and for a sufficient period of time to separate from the slurried filter cake a substantial part of the filter aid particles and centrifuge same radially outwardly along the path but at a velocity less than that required to over-

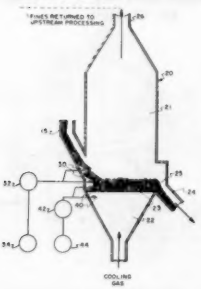
come the drag exerted by the material upon a substantial part of the remaining solids contained in the slurried filter cake, continuously withdrawing a portion of the material including the centrifuged filter aid particles from a point of minimum diameter of each of said paths, causing the balance of the material including entrained filter aid particles, to return freely and without obstruction in the opposite direction through the interior of the vortex to a point removed from the point of minimum diameter of the paths, and processing the balance of the material returned through the interior of the vortex associated with the first path by spinning same in a similar path thereby substantially increasing the amount of filter aid so recovered. The reusable filter aid particles reclaimed from the filter cake have a flow rate of at least approximately 2 1/2% greater than the relative flow rate of the unused filter aid particles used in forming said filter cake, at least approximately 10% greater than the flow rate of the unused filter aid particles used in forming said filter cake where said relative flow rate of said unused filter aid particles was approximately 10 or less, and at least approximately 20% greater than the flow rate of the unused filter aid particles used in forming said filter cake where said relative flow rate of said unused filter aid particles was approximately six or less.

3,831,747

FLUIDIZED BED PROCESSING OF CARBON BLACK

Oscar Thomas Scott, and Bennie Smithers Setliff, both of Borger, Tex., assignors to J. M. Huber Corporation, Locust, N.J.

Filed June 2, 1972, Ser. No. 259,212
Int. Cl. B03b *1/00, 13/00*
U.S. Cl. 209—11 **8 Claims**



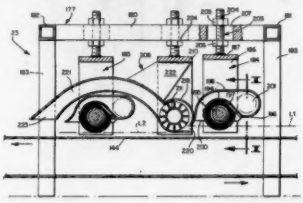
An improved manufacturing technique for simultaneously cooling and separating "fines" and/or contaminants from granular materials or powders such as carbon black is disclosed. The process includes the use of a fluidized bed to effect the removal of fines and foreign matter, the quenching of exothermic reactions and extinguishing of fires as they may exist and the continuous cooling of hot granular materials such as pelletized carbon black. Due to the high rate of heat transfer in the fluidized bed, very rapid cooling of the material is accomplished and in a manner such that, for example, cooled carbon black shows no tendency to spontaneously generate heat or to burn or begin or continue rapid oxidation while in bulk storage and/or transporting facilities. Through proper instrumentation of the fluidized bed, the presence of exothermic reactions, such as fires in the dryer as well as the presence of indothermic reactions, such as the presence of "wet" black can be simply and easily detected.

3,831,748

TRASH SEPARATING APPARATUS

Lawrence Berkowitz, Willingboro; Georgs Novickis, Lindenwold, both of N.J., and Prafulchandra N. Sheth, Landsdowne, Pa., assignors to Dickson Paper Fibre, Inc., Philadelphia, Pa.

Division of Ser. No. 846,320, July 31, 1969, Pat. No. 3,643,797. This application Feb. 14, 1972, Ser. No. 225,852
Int. Cl. B03b *7/00;* **B03c** *7/08*
U.S. Cl. 209—12 **3 Claims**



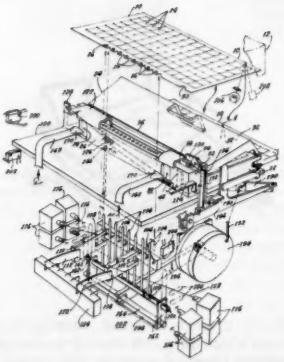
A conveyor transports a mixture of shredded paper materials and film along a predetermined path. Spaced electrostatically charged rotary brushes extracts the film from the mixture. A comb removes the film from the brushes and an exhaust duct carries off the thus removed film. An impeller intermediate the brushes removes the paper material and deposits it again on the conveyor downstream of the second brush.

3,831,749

SELECTOR MECHANISM INCLUDING CASSETTE STORAGE

Alfred M. Nelson, Redondo Beach; Robert G. McPherson, and Maurice S. Martin, both of Palos Verdes Peninsula, all of Calif., assignors to Cubic Industrial Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 247,805, April 26, 1972, abandoned. This application July 17, 1972, Ser. No. 272,192
Int. Cl. B07c *3/10*
U.S. Cl. 209—110.5 **25 Claims**



A selector mechanism for use in selecting an individual one from a plurality of cards and wherein each card has an individual code formed by openings through the card and notches extending from a back edge of the card and including a cassette for receiving and storing the plurality of cards adjacent to each other with the openings and notches aligned along parallel axis and including an open front for allowing

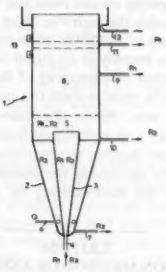
forward movement of the cards in planes perpendicular to the parallel axis and with a table for supporting the cassette in a horizontal plane and with the forward movement of the cards in a horizontal direction and with a pin assembly including a plurality of pin members movable along vertical axes coextensive with the vertical axes of the aligned openings and notches of the cards and with the pin members movable in a vertical direction to have the pin members pass through at least one opening in all of the cards except one and with compressed air coupled to the cards for providing horizontal forward movement of the cards and with all of the cards except the one card restrained by the pin members from forward movement.

3,831,750

SEPARATION OF ION EXCHANGE RESINS HAVING DIFFERENT DENSITIES

Vincent Savall, Velizy-Villacoublay; Pierre Treille, Saint-Cloud, and Jean Bouchard, Paris, all of France, assignors to Degremont, Societe Generale D'Epuration et D'Assainissement, Rueil Malmaison, France

Filed Aug. 7, 1972, Ser. No. 278,284
Claims priority, application France, Dec. 9, 1971, 71.29053
Int. Cl. B03b *3/34*
U.S. Cl. 209—160 **5 Claims**



Improved fluidizing apparatus adapted to separate continuously ion exchange resins having different densities in order to perform their selective classification according to suitable granulometric distributions. The apparatus comprises a first separation chamber and in the lower portion of this first separation chamber a second chamber coaxially thereto having a gradually increasing cross-section from the bottom to the top.

This apparatus is notably applicable to a method of separation if ion exchange resins in movable-bed demineralizing installations in which the resins and their supporting fluid are introduced in the bottom of the second chamber in which they circulate upwards in the first chamber from which they are discharged in different zones depending on their densities.

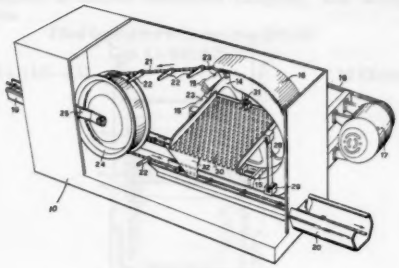
3,831,751

SEPARATING APPARATUS WITH A DRIVE FOR THE CONVEYOR

Camillo Pirovano, 22052 Cernusco Lombardone, Italy

Filed June 26, 1972, Ser. No. 266,342
Claims priority, application Italy, July 8, 1971, 26743/71
Int. Cl. B07b *1/28, 1/42*
U.S. Cl. 209—247 **5 Claims**

A separating apparatus with a conveyor for loose material comprising an endless flexible element, to which a plurality of radially projecting spaced members are fixed, which are slidable in a guide so as to push and convey the loose material charged in said guide, and drive means including a rotative cylindrical rotor, having substantially radial blades, said flexible element being wound on said rotor, so that the blades of the rotor engage the said projecting members, whereby said flexible element is advanced.

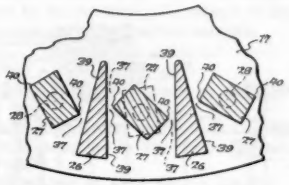


3,831,752

GRADING MACHINE FOR BEANS AND OTHER OBJECTS

Robert L. Holloway, Snyder, N.Y., assignor to Chisholm-Ryder Company, Inc., Niagara Falls, N.Y.

Filed Jan. 18, 1973, Ser. No. 324,736
Int. Cl. B07b *1/00*
U.S. Cl. 209—394 **13 Claims**



A grader for beans and other products including a generally horizontal drum defined by spaced alternating fixed and movable grader bars oriented to define a cylindrical shell, said fixed and movable grader bars being of a predetermined configuration so that mechanism for pivoting the movable grader bars varies the spacing between said fixed and movable grader bars to provide equal spaces between each movable grader bar and the adjacent fixed grader bars on opposite sides thereof in all pivotal positions of said movable grader bars. A grader drum having fixed and movable grader bars oriented as described above for use in a grader.

3,831,753

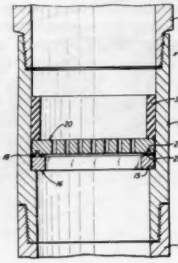
SLOTTED IN-LINE SCREEN

Eber W. Gaylord, Pittsburgh; Robert J. Goodwin, Oakmont, and Ernest A. Mori, Hampton Township, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 18, 1972, Ser. No. 316,348
Int. Cl. B07b *1/52*; **E21b** *7/18, 17/00*
U.S. Cl. 209—399 **10 Claims**

A strainer for preventing the passage of oversized particles suspended in an abrasive-laden liquid flowing through a conduit. The strainer consists of a pair of plates, each of which has a plurality of parallel slots extending through it. The plates are oriented with respect to one another in a manner such that the slots are at an angle, preferably of 90°, to provide openings allowing the abrasive-laden liquid to flow through the assembly.

Interlocking means or cement hold the plates in the desired orientation. In a preferred embodiment of the invention, a spacer between the discs provides additional control of the



size of the openings through the assembly. The plates are of tungsten carbide and preferably of a single solid piece of tungsten carbide in which the slots are cut.

3,831,754

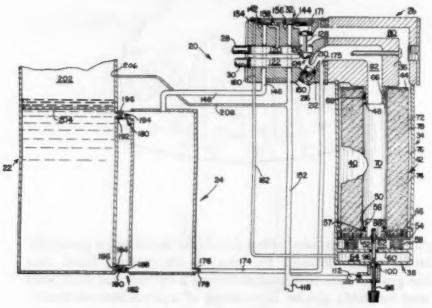
FLUID TREATING APPARATUS

Don Edward Heskett, Villa Park, Ill., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

Filed Aug. 16, 1971, Ser. No. 171,852

Int. Cl. B01d *15/06*

U.S. Cl. 210—80 **39 Claims**



A fluid treating apparatus having a treating cartridge of an active treating material, such as an ion exchange material, which undergoes dimension change upon reduction of its treating capacity as well as upon regeneration of the capacity thereof, a regenerant source (e.g. brine) for regenerating the ion exchange resin, and a dimension sensing mechanism which also operates flow control valves within the apparatus so that the cartridge is regenerated as required by flowing brine or other regenerative material through the cartridge, after which the apparatus automatically returns to its original state. In one described embodiment, the operation of all valves is completely hydraulic and in another embodiment the flow control valves are operated electromechanically. In one embodiment, the apparatus is arranged so that the cartridge dimension is sensed only when fluid flow through the cartridge is interrupted so that regeneration will not occur during use; fluid bypasses the cartridge during regeneration so that flow is not interrupted unintentionally. The active treating material, in a preferred embodiment, is very fine mesh material bound into a cartridge to provide the system with an extremely high rate of exchange.

3,831,755

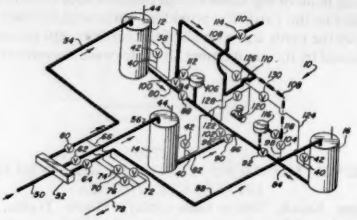
FILTRATION APPARATUS

Brian L. Goodman, Overland Park, Kans.; Frank G. Weis, Kansas City, Mo., and Kenneth A. Mikkelson, Overland Park, Kans., assignors to Ecodyne Corporation, Chicago, Ill.

Filed June 28, 1971, Ser. No. 157,406

Int. Cl. B01d *23/24*

U.S. Cl. 210—108 **8 Claims**



An improved apparatus for the cleaning of filter beds of a filtration apparatus which comprises a plurality of filter units, each of the units having an upper influent zone, a filter bed, and a lower filtrate zone, and including means for pumping liquid from all of the filtrate zones at a given pumping rate. In accordance with the invention, during the service cycle, liquid is pumped by the pump means from the filtrate zones to service, so that it passes through the filter bed in a downflow direction. When one of the filter units requires backwashing, the pump means is employed to pump liquid simultaneously from the filtrate zones of a majority of the filter units, so that the backwash rate is greater than the normal downflow rate through the filter unit. As an alternative to backwashing a minority of the filter unit with liquid from the majority of the units, or in addition thereto, the increased backwashing rate can be provided by increasing the pumping rate beyond the given rate during the backwashing by using booster pump means.

3,831,756

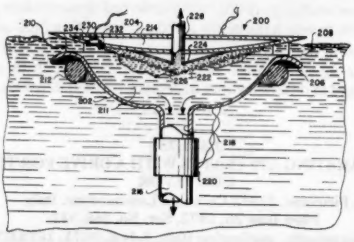
SURFACE TENSION METHOD OF AND APPARATUS FOR SEPARATING IMMISCIBLE LIQUIDS

Pravin G. Bhuta, Torrance; Robert L. Johnson, Marina Del Rey, and Douglas J. Graham, Redondo Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 50,640, June 29, 1970, Pat. No. 3,703,463. This application Sept. 13, 1972, Ser. No. 288,593The portion of the term of this patent subsequent to Nov. 21, 1989, has been disclaimed.

Int. Cl. B01d *21/00*

U.S. Cl. 210—109 **1 Claim**



An apparatus for separating a selected liquid from a second liquid in which the selected liquid is immiscible by a surface tension action utilizing a hollow liquid surface tension separator having a surface tension screen wall is described. The separator is filled with the selected liquid and the outer side of

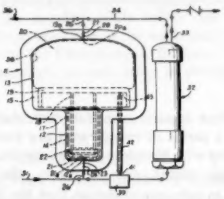
its surface tension screen is placed in contact with the body of immiscible liquids to be separated, such that each screen pore exposed to the second liquid of the body contains a liquid-liquid interface whose interfacial surface tension resists passage of the second liquid through the pore. A pressure differential, less than the critical pressure differential necessary to overcome the interfacial surface tension force acting across the pore, is established across the screen to drive the selected liquid only through the screen into the separator. The primary application of the invention involves the removal or recovery of oil from a water surface utilizing an oil recovery apparatus which floats on and in some cases is propelled along the water surface and is equipped with one or more surface tension liquid separators for extracting the oil from the water surface.

3,831,757

WATER PURIFYING AND DISTRIBUTING SYSTEM

Charles W. Gossett, 14025 Crenshaw Blvd., Hawthorne, Calif. 90250, and William J. Dauenhauer, P.O. Box 487, Gualala, Calif.

Filed Oct. 18, 1972, Ser. No. 298,501
Int. Cl. B01d *31/00*
U.S. Cl. 210—143 **5 Claims**



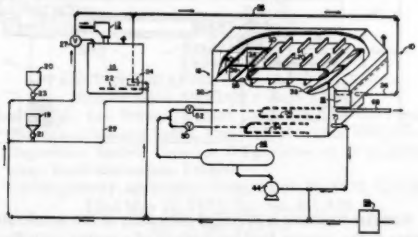
A system of repetitively replenishing a reserve supply in a reservoir of product water discharged from a reverse osmosis module, the input of which is connected to a valve-controlled conventional water service line and the output of which is in communication with said reservoir and a valve controlled product dispensing line.

3,831,758

WASTE TREATMENT SYSTEM

Robert F. Watson, Jr.; Carl Labovitz, and Peter R. Mulik, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 129,686, March 31, 1971, abandoned, which is a continuation-in-part of Ser. No. 80,984, Oct. 15, 1970, abandoned. This application July 5, 1973, Ser. No. 376,849
Int. Cl. B03d *1/00*; **C02c** *1/38*
U.S. Cl. 210—199 **10 Claims**



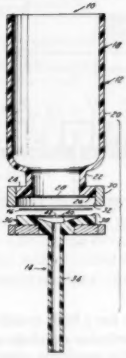
The effluent from a surge-conditioning tank is conveyed through two or more flotation cells flow-coupled in series with stagnation regions therebetween.

3,831,759

FUNNEL WITH MAGNETIC FILTER RETAINER

Charles Gelman, and Attila Vadnay, both of Ann Arbor, Mich., assignors to Gelman Instrument Company, Ann Arbor, Mich.

Filed Sept. 29, 1972, Ser. No. 293,427
Int. Cl. B01d *29/10*
U.S. Cl. 210—232 **12 Claims**



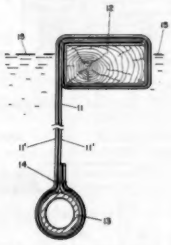
A funnel with a spout assembly slidably received in the lower end of a reservoir assembly to releasably retain a filter disc therebetween. The reservoir and spout assemblies are yieldably urged toward each other to retain the disc therebetween by the attraction of a magnet on the spout assembly for a steel ring on the reservoir assembly.

3,831,760

ACTIVATED CARBON CHEMICAL ADSORPTION ASSEMBLY

James Economy, Eggertsville, and Ruey Y. Lin, Williamsville, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed June 28, 1972, Ser. No. 266,964
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **20 Claims**



Activated carbon textile is provided with a buoyant member (floating support) and a sinking weight, for use in controlling chemical spillage on commercial waterways such as rivers, lakes, oceans and other bodies of water. According to various embodiments of the invention, the activated carbon chemical adsorption assembly can be constructed in configurations which are essentially one dimensional, two dimensional, or three dimensional, with various degrees of dimensional stability. Chemical spillage is preferably controlled by the use of a combination of various embodiments, which differ as to convenience and effectiveness, with the more convenient configurations being somewhat less effective, and the more effective configurations being somewhat less convenient to use.

3,831,761

CLEANING SYSTEM FOR A HIGH SPEED FILTER

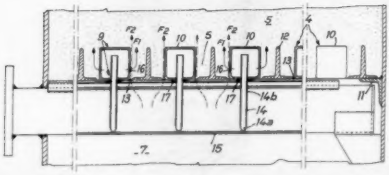
Robert Chantereau, Thionville, France, assignor to Societe Anonyme dite: Societelorraine de Laminage Continu, Paris, France

Filed Nov. 14, 1972, Ser. No. 306,189

Claims priority, application France, Nov. 16, 1971, 71.41009

Int. Cl. B01d 23/24

U.S. Cl. 210—274 15 Claims



A cleaning system for a high speed filter using a filter platform of tubular distributor conduits each conduit having an associated dip tube for providing communication between the conduits and a declogging gas distributor pipe.

3,831,762

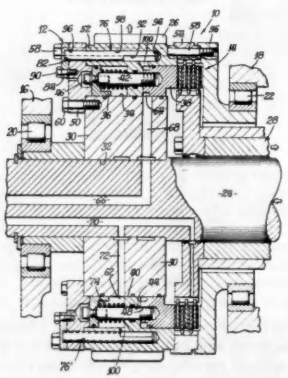
REMOVABLE SEDIMENT CONTAINER FOR ROTATING FLUID SYSTEM

Gunter W. Schulz, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 30, 1973, Ser. No. 346,650

Int. Cl. B01d 35/28

U.S. Cl. 210—297 7 Claims



A removable sediment container mounted within a rotatable fluid housing for collecting suspended deleterious materials which are thrown outwardly by virtue of the rotation of said housing through the impetus of centrifugal force. A plurality of removable sediment containers are disposed in angularly spaced relation about the periphery of the rotatable fluid housing.

3,831,763

SEPARATION APPARATUS

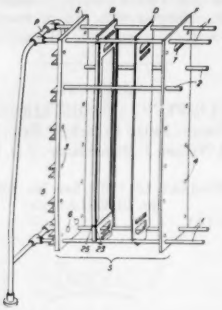
Jacques Breysse, Villeurbanne, and Jean Roget, Lyon, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Feb. 24, 1972, Ser. No. 228,887

Claims priority, application France, Feb. 25, 1971, 71.06493; June 1, 1971, 71.19774

Int. Cl. B01d 31/00

U.S. Cl. 210—321 10 Claims



Separation apparatus useful particularly for ultra-filtration in which a series of membranes are mounted in superposed relationship with membrane supports, and, where appropriate, distribution plates therebetween, the membranes being mounted in sub-assemblies so that the flow of fluid through the individual chambers between the membranes of a particular sub-assembly is substantially in parallel.

3,831,764

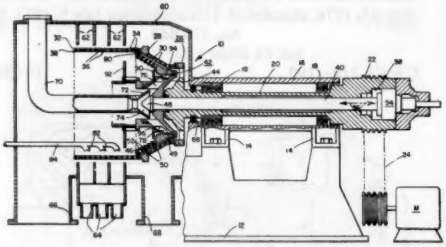
PUSHER-TYPE CENTRIFUGE

Dean Edson Humphrey, Lansdale, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed June 5, 1973, Ser. No. 367,274

Int. Cl. B01d 33/02

U.S. Cl. 210—376 10 Claims

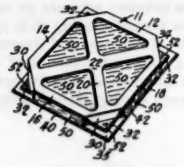


Annular structure is provided outwardly of the accelerator vanes in the annular feed passageway of a pusher centrifuge. The annular structure recombines into an annular stream the subdivided feed streams flowing outwardly of the accelerator vanes, thereby reducing abrasive wear on the screen of the inner rotor.

3,831,765
FILTER FRAME

Robert E. Flynn, Mascouche, Quebec, and Gordon L. Price, Bath, Ontario, both of Canada, assignors to Domtar Limited, Montreal, Canada

Filed Sept. 18, 1972, Ser. No. 290,252
Claims priority, application Canada, Oct. 7, 1971, 124728/71
Int. Cl. B01d *27/08*
U.S. Cl. 210—484 **5 Claims**

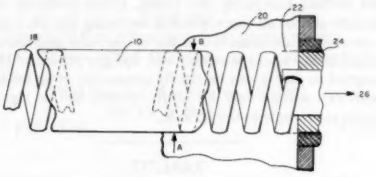


A filter frame is provided by a pair of retaining walls formed of corrugated material and provided with suitable apertures therein with the filter material trapped therebetween. The two frames are spaced by spacing walls which are integrally, foldably connected to at least one of the walls and are secured to the other wall to trap the filter material in place. The retaining walls extend at an angle to each other to prevent collapse of the frame.

3,831,766
FILTER MEDIA

Nicholas S. Newman, West Newton; Robert R. Alexander, Milford, and Donald A. Sheldon, Walpole, all of Mass., assignors to The Kendall Company, Walpole, Mass.

Filed Apr. 9, 1973, Ser. No. 349,118
Int. Cl. B01d *39/18*
U.S. Cl. 210—508 **4 Claims**



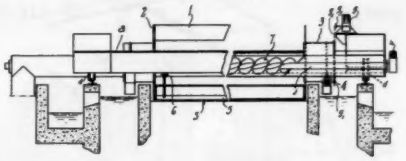
Filter media suitable for use in the filtration of fluids under substantial pressure are derived from nonwoven fabrics comprising a blend of fibers which have a low volumetric wet swelling index and fibers which have a high volumetric wet swelling index.

3,831,767
APPARATUS FOR REMOVING SLUDGE FROM A RECTANGULAR FLOTATION TANK

Jean Lefur, Les Etangs; Robert Louboutin, La Celle Saint Cloud, and Vincent Savall, Velizy, all of France, assignors to Degremont Societe Generale D'Epuration et D'Assainissement, Rueil-Malmaison, France

Claims priority, application France, June 20, 1972, 72.22144
Filed May 18, 1973, Ser. No. 361,839
Int. Cl. B01d *43/00*
U.S. Cl. 210—526 **7 Claims**

An apparatus for extracting sludge from a rectangular sewage flotation tank comprises a bridge structure having rotatably mounted thereon a horizontal drum driven for rotation and provided with suitably shaped vanes, the direction of rotation of the drum and vane assembly being such that at the point of contact thereof with the scraped surface the direction of its velocity vector is opposed to the direction of travel of the bridge structure. The bridge structure also includes a suitably

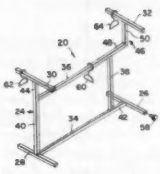


shaped scraper blade pushing the sludge continuously towards the front of the movable vanes of the drum, whereby the extracted sludge is fed to a discharge device mounted inside the tubular shaft of the drum and provided with means for directing the sludge into a container secured to the bridge.

3,831,768
VARIABLE HEIGHT GARMENT RACK

George C. Keller, 35 E. 38th St., New York, N.Y. 10016

Filed Nov. 24, 1972, Ser. No. 309,241
Int. Cl. A47f *5/01*
U.S. Cl. 211—1 **15 Claims**



A garment rack having a fixed frame with several sides and a plurality of rods or sections for garment hangers, or the like, disposed within the frame perpendicularly to provide different heights for different hanger rod sections, in which the hanger rod sections are associated with the sides of the frame so that when the frame is moved with relation to a level support surface to rest on a different side, a hanger rod section will be positioned at a different height from the support surface.

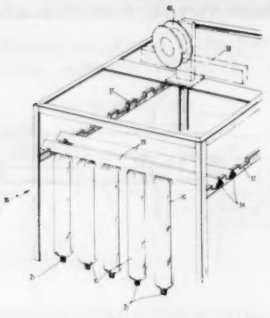
3,831,769
SAUSAGE CASING CLOSURE AND SAUSAGE SMOKING METHOD AND APPARATUS

Joseph J. Frank, 401 Osborne Ave., Brielle, N.J. 08730

Filed Sept. 26, 1969, Ser. No. 861,277
Int. Cl. A47f *5/08*
U.S. Cl. 211—113 **4 Claims**

A novel closure device for the casing of a sausage or the like, such closure device having a flange at the end thereof remote from the sausage whereby the sausage may be hung

upon a smoke stick having a longitudinally disposed dovetail slot adapted to receive the said flanges on the closure devices



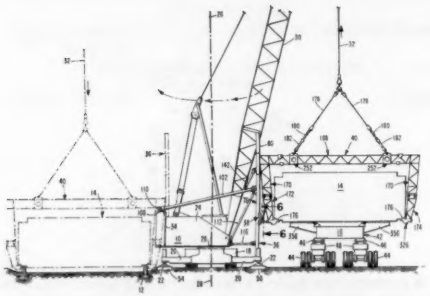
of a plurality aligned sausages. The method and apparatus for smoking sausages provided with such closure devices are also claimed.

3,831,770

SNUBBING FRAME FOR ROTARY CRANES

C. Robert Gottlieb, Mobile, Ala., and Eugene C. Lewis, Scotch Plains, N.J., assignors to Diamonhead Corporation, Mountainside, N.J.

Filed Dec. 6, 1972, Ser. No. 312,575
Int. Cl. B66c *3/00*
U.S. Cl. 212—42.5 **15 Claims**



A self transportable system and method for placing full size, interiorly finished factory constructed housing units the system having as basic components, a vehicular rotary crane, a snubbing frame mountable on the crane to swing with the boom thereof, a load spreader to be handled by the crane during house placement operations and a transporter to position a housing unit relative to the crane and adapted to receive the spreader for site-to-site travel.

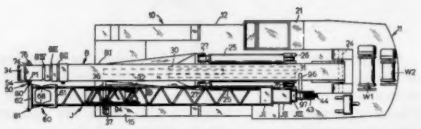
3,831,771

MOBILE CRANE WITH TELESCOPIC BOOM AND JIB AND METHOD FOR CONNECTING THE LATTER

Daniel C. Wiencek, Cedar Rapids, Iowa, assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed Feb. 16, 1973, Ser. No. 333,377
Int. Cl. B66c *23/06*
U.S. Cl. 212—55 **22 Claims**

A mobile crane comprises a multisection telescopic boom and an optionally usable multisection telescopic lattice type jib (having a base section and axially movable intermediate and fly sections) which when not in use is telescoped and stored on a support in parallel reverse disposition alongside the boom. Each jib section comprises four hollow tubular longitudinal members (each of rectangular cross-section) arranged in parallel spaced apart relationship with a plurality of angularly disposed tubular cross braces connected between each pair of members to define a jib section of rectangular cross section. Each longitudinal member is rotated on its axis to present opposite inwardly and outwardly facing flat bearing surfaces and also to present two other opposite flat surfaces to which the ends of the cross braces are welded. Bearing means are provided to facilitate relative sliding motion and to transmit thrust forces between adjacent jib sections. The bearing means comprises inwardly facing slide pads mounted at the lower front ends of the base and intermediate sections and outwardly facing slide pads mounted at the upper and lower rear ends of the intermediate and fly sections; each slide pad being mounted on a support secured within the hollow end of



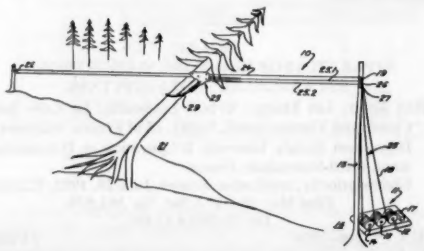
a tubular longitudinal member and engaged with an appropriate bearing surface on an adjacent jib section. To unstore the jib and set it up for use, the foot end of the jib is releasably connected by pivot pin means to the point end of the boom and the boom is partially extended to axially move the jib forward clear of its support. At this stage the unextended jib may be swung 180° about the pivot pin means into axial alignment with the boom and rigidly secured thereto by suitable attachment means. Or, the jib may be partially or fully extended prior to being swung 180° by connecting either the jib intermediate section or the jib fly section, respectively, by releasable rear pin means to the boom base section and by then further extending the boom, either partially or fully, respectively. In all cases, prior to swinging the jib, a guy wire jib mast pivotally attached to the boom point and folded back alongside the boom is swung into upright position. The jib is designed so that it can be rigidly connected at an angle to the boom axis and so that the jib fly section can be rigidly connected at an angle to the jib axis.

3,831,772

LOGGING GRAPPLE AND HAULING ASSEMBLY

Edward Bjarnie Jorgenson, 574 Lowry Lane, North Vancouver, Canada

Filed Mar. 8, 1973, Ser. No. 339,439
Int. Cl. B66c *21/00*
U.S. Cl. 212—84 **3 Claims**



A logging grapple and hauling assembly having an aerial carriage supported on a cable for controlled movement over a

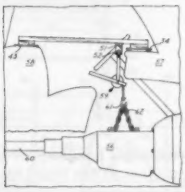
treed area and which carries a depending grapple the latter being remotely operable between closed and opened positions and having laterally extending grappling arms so as to enable the grapple to grasp a standing tree and the carriage then operated to uproot and drag the tree to the landing site.

3,831,773

PORTABLE KNOCK-DOWN HOIST APPARATUS

Finley Paul Haley, 431 Zeta - Space 1235, Golden, Colo. 80401

Filed Feb. 12, 1973, Ser. No. 331,673
Int. Cl. B66c *19/00*
U.S. Cl. 212—139 **9 Claims**



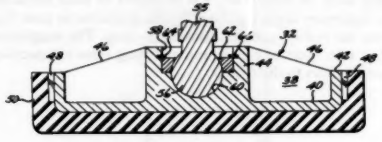
Portable knock-down hoist apparatus for use in readily removing and replacing truck transmissions and clutch assemblies without manual lifting or the use of a jack, has an elongated support beam positioned horizontally above the transmission across the ash and back of the seat, the beam being comprised of two telescoping tubular members separable from one another and a locking pin arrangement therefore to adjust the beam length to selected vehicle cab sizes. A channel section open along the bottom is associated with one of the tubular members and carries a depending trolley assembly which is attached via a chain hoist or the like to the truck transmission to suspend the transmission therefrom for a straight line horizontal movement along the vehicle.

3,831,774

VEHICLE OUTRIGGER PAD STRUCTURE

Harold K. Moore, 4833 Dunrobin Ave., Lakewood, Calif. 90713

Filed Oct. 5, 1973, Ser. No. 404,092
Int. Cl. B66c *23/62*
U.S. Cl. 212—145 **5 Claims**



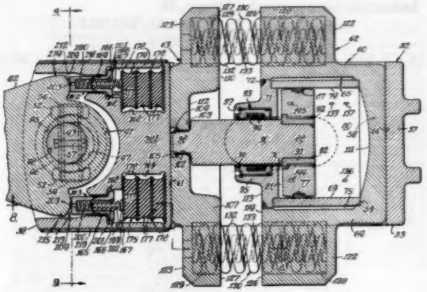
A pad structure of generally circular configuration for attachment to the stabilizing outriggers of a vehicle such as a backhoe. The structure includes a base and peripheral side wall covered with rubber. Each pad structure is mounted to its associated outrigger by a ball joint which allows the pad to rotate and also to conform to the grade of the supporting surface. The pad is resistant to wear because of the rubber material, because of its configuration, and because of its capacity for rotation. Instead of dragging and digging into the supporting surface and adjacent structures, such as curbs and the like, it moves and thereby continually presents new wearing surfaces. Other features include means enabling ready removal and replacement of worn pads.

3,831,775

DRAFT GEAR ASSEMBLY FOR LOCOMOTIVES AND THE LIKE

Vaughn T. Hawthorne, Mechanicsburg, Pa., assignor to Keystone Industries, Inc., Chicago, Ill.

Filed Nov. 29, 1971, Ser. No. 202,825
Int. Cl. B61g *9/08, 9/16*
U.S. Cl. 213—43 **11 Claims**



A draft gear assembly for a locomotive or other railroad vehicle, wherein a hydraulic unit is mounted in a yoke and is arranged to cushion the impact of buff and draft loads applied to a coupler connected to the yoke. A plurality of return springs are mounted in the hydraulic unit so that the overall size of the assembly is reduced to fit a conventional locomotive draft gear pocket. A plurality of resilient pads are mounted in cavities in the coupler end of the yoke, and exert an aligning or centering force on the coupler when the coupler swings a predetermined number of degrees in either direction from a centered position. Such aligning or centering force is exerted on the coupler through one or the other of a pair of laterally spaced, longitudinally shiftable alignment plungers in the yoke.

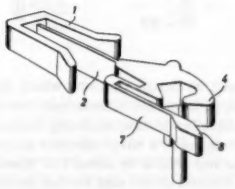
Cushioning and dissipation of the impact force of large buff and draft loads is achieved by restricting the flow of hydraulic fluid in the hydraulic unit of the draft gear assembly, such flow passing through orifices of a particular size and arrangement in the cylinder of the hydraulic unit to an internal reservoir in the unit and then to an external reservoir. Smaller, train handling loads are cushioned primarily through compression of a compressible liquid in the hydraulic unit, when such liquid is utilized as the hydraulic fluid.

3,831,776

ONE-PIECE COUPLING UNIT FOR MODEL RAILROADS

Julius Antonik, Salzburg, Austria, assignor to Heinz Rossler, Salzburg-Morzg, Austria

Filed Jan. 22, 1973, Ser. No. 325,679
Int. Cl. A63h *19/00;* **B61g** *3/00*
U.S. Cl. 213—75 TC **13 Claims**



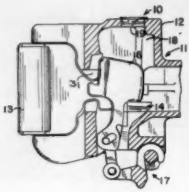
The coupling unit comprises a mounting part attached to a car or locomotive and a coupling part, which is movable in a substantially horizontal plane and carries a coupling hook of

the opposite coupling unit. The coupling part is connected to the mounting part by a resilient tongue and carries a resilient lug, which is laterally disposed relative to the opening in the coupling part and partly closes said opening.

3,831,777
COUPLER LOCKLIFT HOLE CAP

Horst Thomas Kaufhold, Chicago, Ill., assignor to AMSFED Industries Incorporated, Chicago, Ill.

Filed Nov. 19, 1973, Ser. No. 416,984
Int. Cl. B61g *3/04*
U.S. Cl. 213—158 **4 Claims**

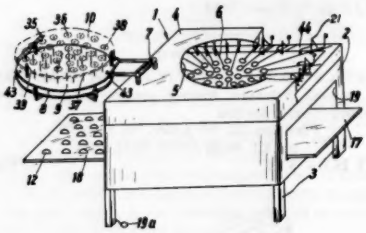


A coupler having a housing including a top locklift hole sealed by a removable cap. The cap is made from plastic and includes a post having a cover plate on the upper end overlying and sealing the hole. A plurality of angularly spaced legs wedgingly engage the inwardly diverging side walls defining the hole so that the cap is removable only by force applied upwardly through the lock chamber.

3,831,778
PORTION POSITIONING APPARATUS, ESPECIALLY FOR DOUGH PORTIONS

Rupert Biber, Pappenheim, Germany, assignor to Hans Beck (Stahlbau-Fertigbau), Augsburg, Germany

Continuation-in-part of Ser. No. 104,292, Jan. 6, 1971, abandoned. This application Aug. 16, 1972, Ser. No. 281,039
Claims priority, application Germany, Aug. 17, 1972, 2141168
Int. Cl. B66c *1/24*
U.S. Cl. 214—1 BD **37 Claims**

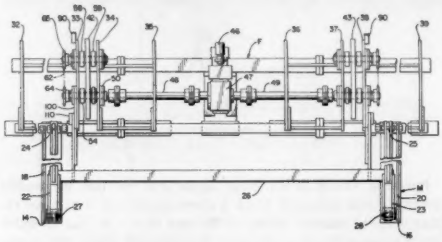


Portions, such as dough portions which must retain their bottoms down position are transferred, for example from a kneading machine, to portion receiving means such as a transport band, by means of a cover member adapted to receive a kneading plate and tiltable by about 180° toward a plurality of transfer arms located above said portion receiving means and also tiltable downwardly for about 45° by the weight of a received portion, whereby each portion is delivered to the receiving means with the bottom facing downwardly. Force exerting means such as spring or counterweight return the transfer arms to their portion receiving position. Preferably, the transfer arms have portion carrying end members shaped as a ring and cooperating with ejector means which reach through the respective ring when the arms are in the portion delivering position.

3,831,779
BAR SORTER

William I. Curtis, Middleburg Heights, Ohio, assignor to The Hill Acme Company, Cleveland, Ohio

Filed Feb. 27, 1973, Ser. No. 336,190
Int. Cl. B23q *5/22*
U.S. Cl. 214—1 P **7 Claims**



A bar sorter for unscrambling elongated bars stacked in parallel horizontal position and delivering them one at a time to a preselected work area. The bar sorter includes a bar holding magazine for holding the bars in stacked horizontal parallel position, and a coacting walking beam type feeder mechanism disposed adjacent the magazine for taking bars from the magazine and delivering them one at a time to an associated work station. The feeder includes a plurality of spaced parallel stationary arms disposed adjacent the magazine for supporting the bars in successive preselected stepped positions thereon. The feeder also includes a pair of spaced parallel walking beam type moving arms interposed between the stationary arms for advancing the bars from the magazine thence to the successive preselected stepped positions on the stationary arms in walking beam fashion, one at a time to an associated work area. The steps on the stationary arms may be adjusted to accommodate bars of various cross-sectional sizes. A pusher lever is provided to push extra bars off the stationary steps and back to the magazine in case more than one bar is disposed on a stationary step. The magazine is provided with hydraulically actuated lifting arms to selectively advance the bars to the feeder.

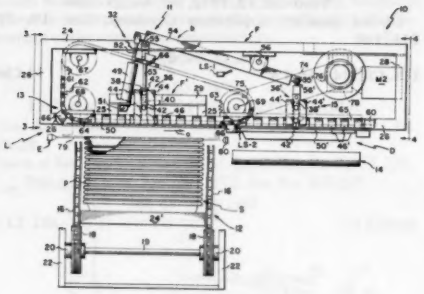
3,831,780
MAGNETIC TRANSFER APPARATUS

Carl R. Skarin; Kenneth H. Dietzel, both of Saginaw, and Roger J. Gendron, Bridgeport, all of Mich., assignors to Baker Perkins Inc., Saginaw, Mich.

Filed Jan. 12, 1972, Ser. No. 217,391
Int. Cl. B65g *57/04, 60/00*
U.S. Cl. 214—6 DS **16 Claims**

Transfer apparatus is provided which is, for example, selectively operable to successively stack or unstack magnetizable pans or like articles. The apparatus includes a vertically movable magnetic field producing pickup member at a pan lifting station for gripping a pan at a lowered position and lifting it to a raised position, a pusher member for engaging and moving the raised pan to strip the raised pan from the pickup member

and laterally transfer it to a pan depositing station, a magnetic field producing pan receiving member at the depositing station for receiving the pan, and a stripper member which permits stripping of the raised pan from the receiving member.



3,831,781

APPARATUS FOR ASSEMBLING INDIVIDUAL PILES OF PRINTED MATTER INTO STACKS

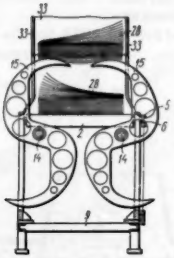
Nikolai Ivanovich Anikanov, Bolshaya Bronnaya ulitsa, 2/6 kv. 6; Leonid Pavlovich Grachev, ulitsa Serafimovicha, 2, kv. 181, both of Moscow; Samuil Aronovich Goltsman, Borschagovskaya ulitsa, 8, kv. 12, Kiev; Grigory Iosifovich Zax, ulitsa Mechnikova, 14a, kv. 24, Kiev; Alexandr Ivanovich Oleinik, ulitsa Mechnikova, 11, kv. 14, Kiev; Grigory Avramovich Radutsky, 16 Parkovaya ulitsa, 49, korpus 2, kv. 68, Moscow; Kheifets, Brest-Litovsky prospekt, 162, kv. 30, and Evgeny Arkadievich Baburin, prospekt Romena Rollana, 25, kv. 264, both of Kiev, all of U.S.S.R.

Filed Mar. 20, 1973, Ser. No. 343,163

Claims priority, application U.S.S.R., July 19, 1972, 1811463

Int. Cl. B65g *57/30*

U.S. Cl. 214—6 BA **3 Claims**



An apparatus for assembling individual piles of printed matter into multi-pile stacks is disclosed wherein a pair of shafts are mounted along a rollerway at both sides thereof, the shafts being synchronously rotatable in opposite directions and non-rotatably carrying thereon S-shaped levers. A retaining mechanism is adapted to arrest these levers in two positions: in the first position the arms of the levers are brought together above the rollerway to support thereon a stack of piles; in the second position the levers are spread apart to clear from below the stack that has been supported thereon, whereby the stack is lowered upon the rollerway.

3,831,782

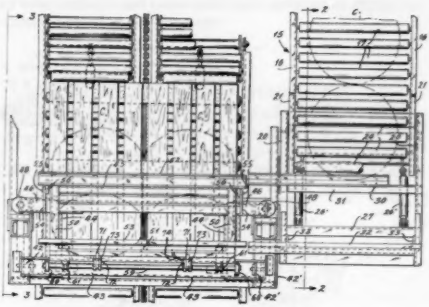
DRUM OR BARREL PALLETIZER APPARATUS

Charles W. Werntz, Ferguson, Mo., assignor to Alvey, Inc., St. Louis, Mo.

Filed June 11, 1973, Ser. No. 369,068

Int. Cl. B65g *57/28*

U.S. Cl. 214—6 P **15 Claims**



A palletizer for large heavy drums or barrels which avoids the necessity for employing hoist devices by relying on the much simpler handling apparatus for tilting the drums or barrels to an over-center stable position on a track that is slanted sufficiently to cause the drums or barrels to roll from a receiving station to a pallet loading station. Each of the receiving and loading stations is provided with a tiltable portion of the slanted track, and that portion of the track in the loading station is tiltable to return the drums or barrels to an upright normal position.

3,831,783

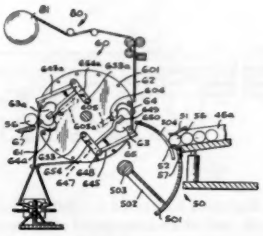
COIN WRAPPING MACHINE

Peter Pilat, Rockaway, N.J., assignor to The National State Bank, Elizabeth, N.J.

Division of Ser. No. 759,322, Sept. 12, 1968, Pat. No. 3,608,271. This application Apr. 29, 1971, Ser. No. 138,773

Int. Cl. B65g *60/00*

U.S. Cl. 214—7 **18 Claims**

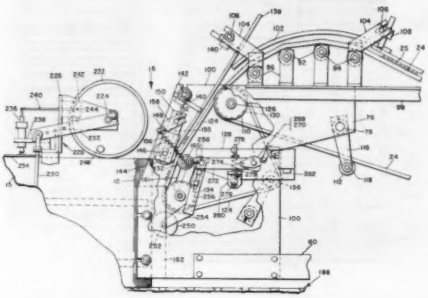


A device is disclosed that comprises a means to form a stack of coins from a plurality of loose coins and to transport the stack of coins to a coin wrapping head in a coin wrapping machine. The loose coins are operatively into a plurality of tracks that cause the coins to converge toward a position wherein they are on edge and abutting each other. Gripping means are provided for holding the stack of loose coins at its ends as the coins move toward the wrapping head. Means operatively coupled to the gripping means for separating the gripping means from the coins at the wrapping head.

3,831,784
CARTON MAGAZINE AND MEANS FOR LOADING THE SAME

Arthur F. Newell, South Weymouth, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed May 15, 1972, Ser. No. 253,613
Int. Cl. B65g 60/00
U.S. Cl. 214—7 16 Claims

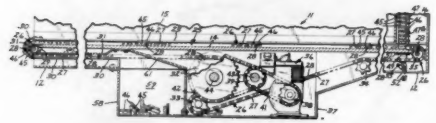


A carton magazine in which successive flat tubular cartons are advanced and withdrawn wherein provision is made for loading succesive cartons into the magazine as they are produced and transferred from a carton side seaming machine and wherein provision is further made for controlling the loading operation to maintain a substantially constant supply of cartons in the magazine.

3,831,785
SELF-UNLOADING STRUCTURE FOR WAGON BOXES

Howard D. Rezac, 403 Spencer St., Gregory, S. Dak. 57533

Filed Sept. 21, 1973, Ser. No. 399,608
Int. Cl. B65g 59/06
U.S. Cl. 214—8.5 G 20 Claims

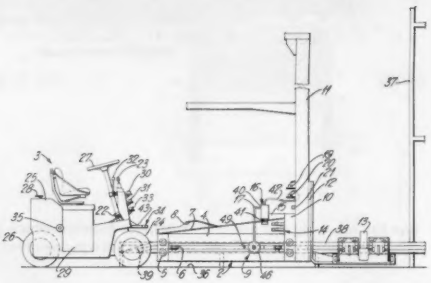


The disclosure is directed to a flat bed hauling trailer having side walls, and which is equipped with apparatus for automatically unloading material from the flat bed. The unloading apparatus comprises a plurality of elongated unloading slats or bars which are moved in spaced relation by a conveyor over the length of the bed and transverse thereto to carry the loaded material to a discharge point at the back of the trailer. To permit the trailer to be used without the unloading apparatus, the conveyor is constructed and arranged to drop the unloading slats after they have moved around the discharge point into a collecting container one at a time. The transversely movable unloading bed is reformed by placing the unloading slats into a magazine in vertical stacked relation, and releasing the slats one at a time to be picked up and moved by the conveyor in the predetermined spaced relation.

3,831,786
MATERIAL HANDLING APPARATUS

Karl-Heinz Griesenbrock, Duisburg, Germany, assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 12, 1972, Ser. No. 297,108
Claims priority, application Germany, Oct. 19, 1971, 2151940
Int. Cl. B65g 1/10
U.S. Cl. 214—16.4 A 11 Claims

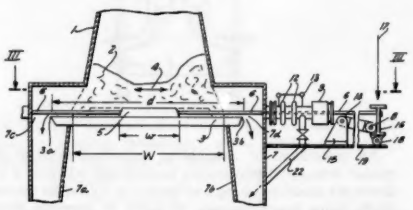


A material handling apparatus comprising a rail supported and guided carriage, preferably including a shuttle assembly for narrow aisle operations, and a separate rubber tired, steerable drive vehicle. The carriage and drive vehicle are adapted to be coupled together with the steered wheel(s) of the drive vehicle lifted off the floor for in-aisle operation. An hydraulic press on the carriage applies a constant downward force on the drive wheels of the drive vehicle when the carriage and drive vehicle are coupled together, and a spring-loaded brake which is automatically released by operation of the hydraulic press acts against the aisle rails to hold the carriage in position for coupling and for safety purposes in case of hydraulic system failure.

3,831,787
DISCHARGE DEVICE FOR DIRECT-REDUCTION SHAFT FURNACE

Rudolf Grewer; Herbert Hickmann, both of Oberhausen, and Hermann Trecker, Hunxe, all of Germany, assignors to Thyssen Niederrhein AG, Hutten- & Walzwerke, Oberhausen, Germany

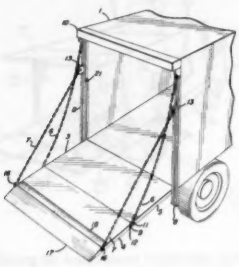
Filed Feb. 20, 1973, Ser. No. 333,743
Claims priority, application Germany, Feb. 24, 1972, 2208775
Int. Cl. F27b 9/22
U.S. Cl. 214—23 6 Claims



A discharge device for a direct-reduction shaft furnace, e.g. of the type used to produce sponge iron from iron ore, comprises a discharge or scraper bar or plate reciprocable beneath the column of charge in the furnace to displace the sponge iron alternately toward one side and the other and thus into

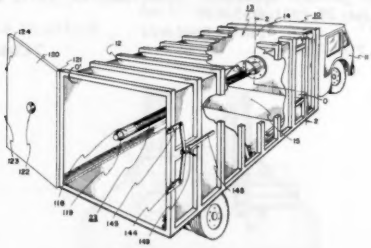
respective outlets. The discharge bar or plate is provided with a pair of rods on each side, the rods extending in the direction of displacement. Floating bearings sealingly engage each rod and are connected to the housing. The floating bearings are provided with gas-type seals, motion-compensating members between the seals and the housing, and means limiting the displacement of the seal or packing structure.

3,831,788
LIFT HAVING SELF-FOLDING PLATFORM
Atwood E. Erlinder, 12221 S. Indiana Ave., Palos Heights, Ill. 60628
Division of Ser. No. 53,872, July 10, 1970, Pat. No. 3,675,739.
This application Apr. 27, 1972, Ser. No. 248,327
Int. Cl. B60p *1/44*
U.S. Cl. 214—75 T **11 Claims**



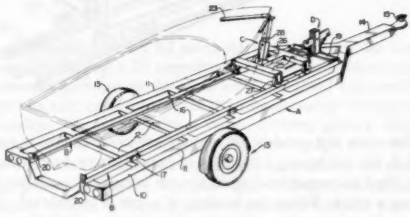
A lift which contains a self-folding platform is disclosed. The rear of a truck may be equipped with the lift to provide a loading and unloading device as well as a tailgate for the truck.

3,831,789
WASTE REMOVAL VEHICLE AND STRUCTURE ASSOCIATED THEREWITH
John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corporation of America, Salt Lake City, Utah
Filed Dec. 14, 1972, Ser. No. 315,130
Int. Cl. B60p *1/00*; **B65g** *67/26*
U.S. Cl. 214—82 **4 Claims**



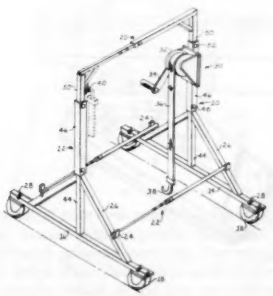
The truck type vehicle constructed to receive, transport and dump municipal waste, garbage, industrial debris and so on, and this using for storage a maximum of space within the truck body, notwithstanding the inclusion of apparatus for compacting or packing material preparatory to the taking on of subsequent loads. The subject truck includes a packer panel driven fore and aft within the truck body by a threaded shaft. The shaft is journaled forwardly and also at a rear door rearwardly of and a part of the truck body. The packer panel supports its driven threaded shaft, when the rear door is open, by the packer panel being proximate its rear-most extremity. Means are provided for keeping the threaded shaft of the truck body clean from debris and bearing surfaces free of dirt or other foreign matter. Means are provided for powering the packer panel, through revolvement of the threaded shaft, either by the power take-off of the truck or by a gear reduced electric motor drive. Safety means are provided such that the packer panel will not exceed its predetermined limits of travel and, also, can be stopped at any time and at any point intermediate of such extremities. Means are provided for keeping clean wear surfaces and caster and track surfaces, as applies to the caster supported packer panel.

3,831,790
BOAT LOADING AND UNLOADING KIT
Edward Farris, 16 Coventry, Oroville, Calif. 95965
Filed Oct. 27, 1972, Ser. No. 301,375
Int. Cl. B60p *3/10*
U.S. Cl. 214—83.24 **7 Claims**



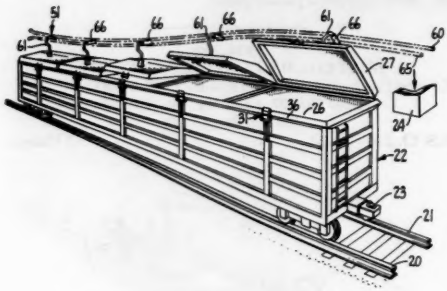
A kit comprising a wheeled carriage and rails adapted to be assembled and secured to a boat trailer for facilitating the loading and unloading of a boat therefrom.

3,831,791
CARPET HOIST
Carmen R. Gonzales, 2619 W. 5th, Plainview, Tex. 79072
Filed Jan. 17, 1973, Ser. No. 324,489
Int. Cl. B60p *3/00*
U.S. Cl. 214—396 **5 Claims**



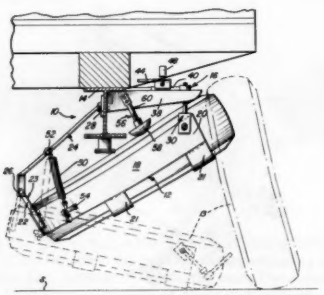
A straddle-type hoist has four caster wheels. A strap is wound on a winch proximate the top of one of the legs. The hoist may be moved forward over a roll of carpet and sideways as the carpet is rolled sideways to get the strap under the carpet. After the strap and carpet are lifted by the winch, carry bars are placed across the feet of the hoist to support the carpet while it is being moved from one position to another. The crossbar, carry bars and the legs are telescoped for changing the height thereof.

3,831,792
RAILROAD CAR CONSTRUCTION
Fred W. Waterman, Daly City; Tadeusz Katyll, San Francisco, and Colin C. Eldridge, Menlo Park, all of Calif., assignors to Otter Trail Power Company, Fergus Falls, Minn.
Filed Jan. 22, 1973, Ser. No. 325,632
Int. Cl. B61d 39/00
U.S. Cl. 214—42 R 8 Claims



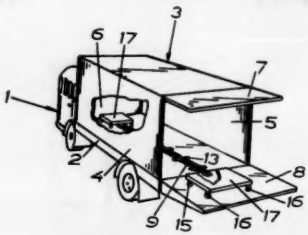
An open top gondola or hopper car construction is provided, the car having a plurality of hinged cover doors which are lifted to permit loading as the car is moved continuously along a track. When the loading of a car is completed, the cover doors are returned to closed position in which they are latched until the car arrives at a discharge station where again, with the car moving, the latch is released and the cover is raised a small amount by springs to permit unloading of the car as the car is rotated in a rotary dumper of known construction.

3,831,793
TRUCK TIRE SPARE CARRIER
Dennis E. Eller, 331 N. Thovington, Algona, Iowa 50511
Filed Oct. 2, 1972, Ser. No. 294,266
Int. Cl. B62d 43/00
U.S. Cl. 214—454 17 Claims



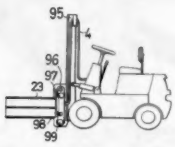
A spare tire support for vehicles such as trucks and the like has a supporting frame including an arcuate member mounted substantially between its end portions to a chassis of a vehicle by means of a hanger bracket, and arranged for swinging movement beneath the chassis between a loading and unloading position, and a storage position. Clamp elements pivotally mounted on the end portions of the arcuate member cooperate with associated cantilevers mounted on the chassis to selectively retain the frame in its storage position. Coiled springs are connected to and extended between the hanger bracket and the arcuate member for counterbalancing at least a portion of the weight of the frame and a vehicle tire supported by the frame and bias the frame toward its storage position.

3,831,794
LOAD-CARRIER
Gote Hubert Bohman, Hudiksvall, Sweden, assignor to B. V. Foco Nederland, Bedum, Netherlands
Filed June 4, 1973, Ser. No. 366,418
Claims priority, application Sweden, July 17, 1973, 9372/72
Int. Cl. B60p 1/38
U.S. Cl. 214—516 6 Claims



In a continuous conveyor positioned on goods vehicle platforms and comprising equidistantly spaced carriages, load carrying elements provided with guide rails and blocking means arranged to cooperate with correspondingly shaped guide and blocking means on said carriages for interconnecting said carriages and said carriers whereby the latter may be advanced by means of said conveyor.

3,831,795
SIDE SHIFT CLAMP DEVICE
Kunishisa Kawanishi, Okazaki; Seigo Shimizu, Kagamihara, and Takio Baba, Nakano, all of Japan, assignors to Kabushiki Kaisha Toyoda Tidoshokki Seisakusho, Kariya-shi, Japan
Filed July 12, 1972, Ser. No. 271,200
Claims priority, application Japan, July 13, 1971, 46-51998; July 28, 1971, 46-56659
Int. Cl. B66f 9/14
U.S. Cl. 214—731 7 Claims



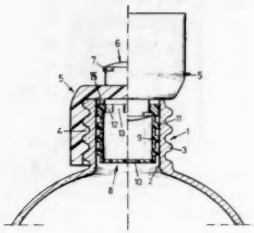
A hydraulically operated side shift clamping device for use in a fork lift or light cargo conveying appliance. The device comprises two hydraulically operated cylinders having pistons which pistons operate to open and close clamping arms attached thereto. A first oil passage supplies oil commonly to the space in the hydraulic cylinder rearwardly of the pistons while second and third oil passages are connected respectively to each hydraulic cylinder forwardly of the pistons. A short circuit connection is provided between the second and third oil passages which short circuit connection has a pair of oppositely arranged pilot check valves. A further pilot check valve is provided in the first oil passageway and a pilot connec-

tion is made between the intermediate point of connection of the two pilot check valves short circuiting the second and third oil passages and the pilot check valve in the first oil passageway.

3,831,796
SAFETY CLOSURE

Antonius Bernardus Claasen, Sperwerlaan 4, Leende (NB), Netherlands

Filed Aug. 23, 1972, Ser. No. 283,166
Claims priority, application Netherlands, Aug. 25, 1971, 7111693
Int. Cl. A61j *1/00*; **B65d** *55/02*
U.S. Cl. 215—9 **10 Claims**

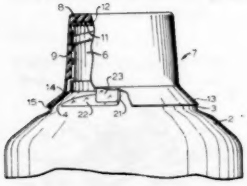


The invention relates to a safety closure for a container mouthpiece having an external screwthread and a cap having an internal screwthread mating therewith and an insertable stopper, and in which the stopper and a top portion of the screwcap are provided with complementary members which co-operate to function in the manner of a bayonet catch whereby the screwcap acts as a means for withdrawing the stopper from the mouth of the container and such that on effecting the withdrawal the stopper remains in attachment with the screwcap.

3,831,797
CHILD RESISTANT SAFETY CLOSURE

Peter P. Stevens, Jr., P.O. Box 95, Point Reyes, Calif. 94956

Filed Oct. 2, 1972, Ser. No. 293,843
Int. Cl. B65d *55/02*
U.S. Cl. 215—9 **11 Claims**

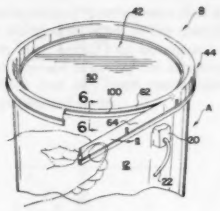


Child resistant safety closure for containers containing poisonous products found around a home in which the container has latching means and a closure with a skirt portion has latching means cooperable with the latching means on the container. The skirt portion forms an integrally hinged part of the closure and covers the latching means rendering them inaccessible in the latched condition. The hinge connection enables the skirt to be displaced, disengaging the latching means and allowing removal of the closure.

3,831,798
CONTAINER SEALING LID

Edgar R. Rowe, Cleveland, and Robert R. Terlop, Brookpark, both of Ohio, assignors to Van Dorn Company, Cleveland, Ohio

Filed July 18, 1972, Ser. No. 272,766
Int. Cl. B65d *41/22*
U.S. Cl. 215—256 **9 Claims**

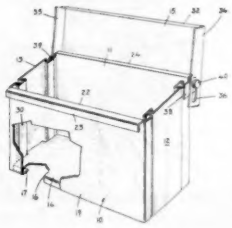


A container sealing lid particularly adapted for use with a container having a lid supporting and sealing bead extending therearound adjacent the open top end thereof and which lid permits easy removal thereof from its container sealing relationship. The lid includes a bead receiving groove integral therewith which is comprised of an inner wall, a top wall and an outer wall. A zone of reduced wall thickness at the area of the groove joining the top and outer walls permits the outer wall to be torn by hand from its connection with the top wall to thus facilitate lid removal. Elongated slots disposed at spaced intervals around the outer wall provide convenient means for starting the tearing action.

3,831,799
SHEET METAL PANEL ASSEMBLY

Wallace H. Nutt, Woodstock, Ontario, Canada, assignor to Teledyne Canada, Limited, Rexdale, Ontario, Canada

Filed June 20, 1972, Ser. No. 264,500
Int. Cl. B65d *7/00*
U.S. Cl. 220—4 F **6 Claims**



In a sheet metal panel assembly, the panels to be secured together are formed with respective elongated, transversely folded, rectilinear marginal portions. The marginal portions respectively define a rectilinear groove or socket and a complementary tongue which is slid into the socket endwise to provide a rigid joint.

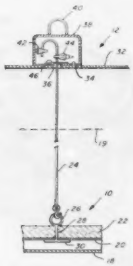
3,831,800
FLOATING ROOF PLURAL POSITION SUSPENSION

Donald L. Korn, Sapulpa, Okla., assignor to Tresco, Incorporated, Sapulpa, Okla.

Filed May 22, 1972, Ser. No. 255,841
Int. Cl. B65d *87/18*
U.S. Cl. 220—26 R **6 Claims**

This invention describes a system by means of which a floating roof inside of a closed roof tank can be supported at two or

more vertical positions within the tank by means accessible at the fixed roof of the tank. The floating roof is constructed inside of the closed roof tank and is made up of a horizontal plastic-fiberglass plate with foam plastic filler to provide a unitary construction that will float on top of the surface of a



liquid in the tank. There are a plurality of flexible tensile members which are attached to the floating roof and are anchored at a plurality of fixtures on the fixed roof so that the tank can be supported by these tensile members irrespective of the level of the supporting liquid in the tank.

3,831,801

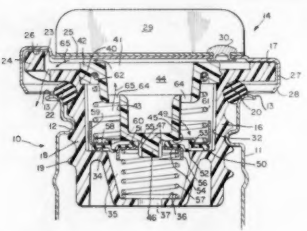
PRESSURE-VACUUM VALVED CAP

Robert E. Rodgers, Connersville, Ind., assignor to Stant Manufacturing Company Inc., Connersville, Ind.

Filed Nov. 20, 1972, Ser. No. 307,821

Int. Cl. B65d *51/16, 41/04;* **F16k** *17/26*

U.S. Cl. 220—39 R **8 Claims**



A pressure-vacuum cap for a chamber having a filler neck, the cap comprising a housing proportioned and designed to engage and close the filler neck. The housing provides a passageway extending axially therethrough in communication with the filler neck and, intermediate the ends of the passageway, a concentric annular outwardly facing seat and a concentric annular inwardly facing seat. A gasket closes the passageway, the gasket having an outer peripheral portion in sealing engagement with one of said seats and an inner peripheral portion in sealing engagement with the other of said seats. Springs yieldably urge the gasket into sealing engagement with the seats. The springs are calibrated such that the gasket serves as a two-way valve for normalizing the pressure in such a chamber, venting the chamber to atmosphere when the pressure in the chamber exceeds a predetermined superatmospheric level and when the pressure in the chamber drops below a predetermined subatmospheric level.

3,831,802

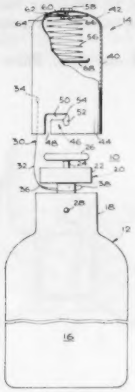
PROTECTIVE CAP AND FLUID CYLINDER ASSEMBLY

Harley Edward Chambers, 550 W. 93rd St., Los Angeles, Calif. 90045, and Richard E. Hoagland, 120 S. Sierra Madre Blvd., Pasadena, Calif. 91107

Continuation-in-part of Ser. No. 93,668, Nov. 30, 1970, abandoned. This application Oct. 12, 1971, Ser. No. 188,152

Int. Cl. B65d *41/06*

U.S. Cl. 220—40 R **8 Claims**



A fluid cylinder body is provided with a protective cap. The cap fits over the cylinder valve handle and has a notch to receive a retainer pin carried on the cylinder. A spring is centrally disposed within the cap and bears against the handle through a pusher plate to releasably secure the pin in the notch and also protect the handle. The pusher plate may be configured to aid in centering the cap around the handle. A second spring may be provided to help bias the pin against a notch detent.

3,831,803

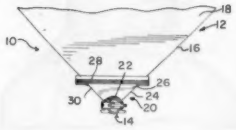
RESILIENTLY MOUNTED RAILWAY HOPPER CAR OUTLET

John W. Hutchison, Crown Point, and Marvin Stark, Michigan City, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Dec. 4, 1972, Ser. No. 312,162

Int. Cl. B61d *7/14, 7/32;* **B65g** *3/14*

U.S. Cl. 220—46 R **9 Claims**



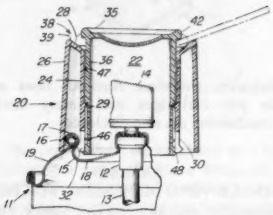
An arrangement for discharging materials from a hopper which includes a gate structure having a housing provided with flanges adapted to be connected to the flanges at the lower part of the housing wherein a resilient gasket is disposed in compressed relation between the flanges of the gate housing and the lower part of the hopper, the gasket having side sections running the length of the hopper and end sections running the width of the hopper, each side section having a bevel on the slope sheet side of the hopper to allow for free flow of the lading inside the hopper, the end section having a similar type of bevel except that the bottom is contoured to

hug the vertical end panel of the discharge gate, said gasket further having two dimples running continually therearound to insure airtight seal, and lastly the bottom of the gasket being contoured to make the transition from the vertical end panel to the slope on the side panel without leaving a hole or bulge that could cause an air leak.

3,831,804
AEROSOL SAFETY CAP

John Richard Focht, Yonkers, N.Y., assignor to Precision Valve Corporation, Yonkers, N.Y.

Filed May 2, 1972, Ser. No. 249,608
Int. Cl. B65d *43/10*
U.S. Cl. 220—60 R **16 Claims**

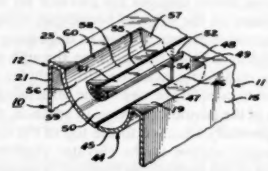


An aerosol safety cap for an aerosol container including inner and outer telescoping members. The outer member includes dependent resilient locking means which snap under the interior of the annular bead of the mounting cup of the aerosol container to affix the outer member to the container. When the inner member is telescoped into the outer member, it prevents the resilient locking means from being inwardly deflected thereby preventing removal of the cap assembly from the container. Withdrawal of the inner telescopic member permits deflection of the depending locking means to permit removal of the cap from the container. The inner member cannot be withdrawn without the aid of a prying instrument such as a coin. The cap can be doubly locked by rotating the inner member with respect to the outer member with an instrument such as a coin into a position in which it cannot be pried upwardly.

3,831,805
PORTABLE TOOL CONTAINER OR THE LIKE

Everett R. Yonce, 259 E. 12th St., Oakland, Calif. 94606

Filed May 6, 1971, Ser. No. 140,860
Int. Cl. A45c *11/26*
U.S. Cl. 220—94 A **2 Claims**

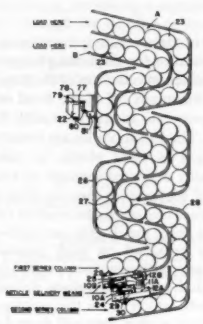


A portable container adapted to receive and support tool implements or the like therein in a predetermined organization. The container comprises a pair of box-like container sections each of which is open along one side but is otherwise completely closed. The container sections are hingedly secured to each other for swinging movements between open and closed positions to permit access into the chamber defined within the interior thereof, and a plurality of partitions are pivotally supported within the chamber and effectively divide the same into a plurality of compartments. Each partition and at least certain of the inner surfaces of the container are equipped with support means adapted to releasably secure a plurality of tool implements in an organized array within the container. A handle structure is recessed into at least one of the walls of the container in a manner such that a part of each handle structure is defined by each of the container sections which enables each such section to be supported when the container is carried, thereby relieving the hinge connection of the container sections and any latch mechanism associated therewith from asymmetrical stress.

3,831,806
VENDING MACHINE HAVING PRODUCT LEVEL SENSING SWITCH AND METHOD OF CONVERSION OF MULTI-COLUMN VENDING MACHINES FOR CONJOINT OPERATION OF AT LEAST TWO COLUMNS

James C. Lindsey, Chattanooga, Tenn., assignor to Cavalier Corporation, Chattanooga, Tenn.

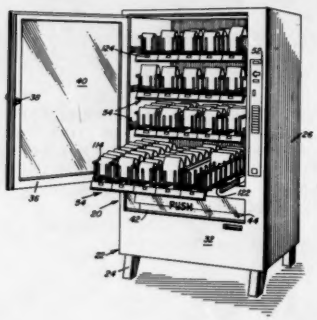
Filed Nov. 3, 1972, Ser. No. 303,360
Int. Cl. G07f *11/10*
U.S. Cl. 221—1 **14 Claims**



A coin operated multi-column vending machine embodies a separate product delivery means for each column of product units and associated circuit components including plural customer-operated product selector switches. One such selector switch is removed from a customary circuit and two product unit columns are placed under control of a product level sensing switch and one selector switch for conjoint operation. The product level sensing switch is mounted approximately midway of one of the two product unit columns and is electrically connected in the control circuit to respond to product depletion in said one column of the connected pair of columns to a predetermined level in the column and transfer dispensing control to the second column of the connected pair. Selective product dispensing from the second column is continued until the second column is empty. Thereafter, despensing control is automatically transferred back to the first column and the remaining product units in the first column are selectively dispensed until the products in that column are fully depleted. The invention is particularly applicable to vending machines for dispensing carbonated soft drinks or other food products which are subject to staleness if

left too long in the machine. The invention allows for easy modification and conversion of existing multi column vending machines and their associated control circuits in the field.

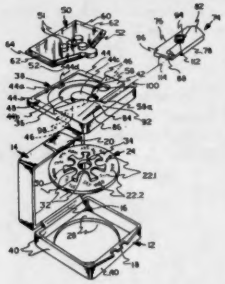
3,831,807
VENDING MACHINE DISPENSING MODULE TRAY
James M. Deaton, and Clarence M. Deaton, both of Conway, Ark., assignors to Vendmart, Inc., Corpus Christi, Tex.
Filed Mar. 28, 1972, Ser. No. 238,816
Int. Cl. G07f *11/58*
U.S. Cl. 221—85 **3 Claims**



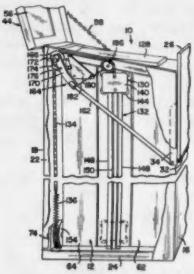
An assembly for use in a vending machine in the form of a tray of modular structure for dispensing bagged or packaged products that are loaded into the top of the tray and dispensed by being moved horizontally off of the front edge of the tray and dropped by gravity into an area accessible from the exterior of the dispenser. The tray modules are constructed of transparent material such as clear plastic to enable all of the products to be readily observed through an enlarged window in the front door of the cabinet thereby providing a vending apparatus that enables customer observation of the bagged or packaged products and the highly attractive packages or wrappers normally provided on such products. Each tray module includes a supporting surface on which the articles to be dispensed rest and conveying means including article-engaging fingers or tabs which move the articles off the end of the supporting surface so that they will drop downwardly into an access area. The vending machine includes multiple tray assemblies with the two uppermost tray assemblies being swingable downwardly to an inclined position when they are pulled outwardly at the front of the machine to facilitate loading. Each tray module includes an electrically operated power unit that is automatically engaged when the tray assembly is moved to its operative position and automatically disengaged when the tray assembly is moved to its extended or loading position.

3,831,808
PILL CARTRIDGE FOR A PILL DISPENSER
Louis Bender, 4 Heather Ln., Scotch Plains, N.J. 07076
Division of Ser. No. 189,647, Oct. 15, 1971. This application Feb. 12, 1973, Ser. No. 331,644
Int. Cl. B65d *83/04*
U.S. Cl. 221—197 **4 Claims**

Mechanisms are disclosed for storing pills and dispensing them one at a time at indicated intervals. The dispenser includes a time interval read-out, and a mechanism for advancing the read-out by one pill time interval whenever a pill is withdrawn from storage. If the mechanism is operated but no pill is withdrawn, the time read-out does not advance. Replaceable pill cartridges and safety covers for the dispensing mechanism are also disclosed.



3,831,809
SINGLE-VEND DISPENSING MACHINE
Karl Knickerbocker, 400 Baycrest Dr., Venice, Fla. 33595
Filed May 18, 1973, Ser. No. 361,639
Int. Cl. B65g *59/02*
U.S. Cl. 221—227 **13 Claims**

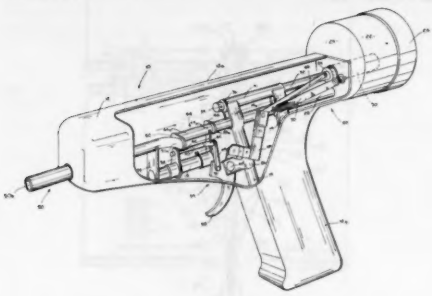


A single vend periodical dispensing machine configured for use with a coin operated mechanism for dispensing a single item during each cycle of operation. The dispensing machine includes a cabinet housing and periodical support means comprising an elevator platform, means, elevator lift means and elevator release means operatively disposed therein. The elevator release means engages the elevator lift means to relieve the pressure on the stack of periodicals being dispensed to prevent excessive pressure when in dispensing position to facilitate withdrawal from the machine through a dispensing opening. The dispensing machine also includes a thickness control means to control the size of the dispensing opening as the thickness of the periodical varies. In addition, a loading access door is pivotally attached to the top of the cabinet housing and arranged relative to the elevator platform means to permit leading of the periodicals thereon. A dispensing access door is pivotally attached to the front of the cabinet housing to permit withdrawal of the periodical through the dispensing opening. The loading access door houses a dispensing control means arranged relative to the dispensing opening to limit dispensing of a single item each cycle such that when the proper coins are inserted into the coin operated mechanism the dispensing door is released, unlocking the control means to dispense a periodical.

3,831,810
BEARING DISPENSER

Lee F. Hamme, Rt. 2, Warrenton, N.C. 27589

Filed Sept. 11, 1972, Ser. No. 287,783
Int. Cl. B65h 3/30
U.S. Cl. 221—301 2 Claims

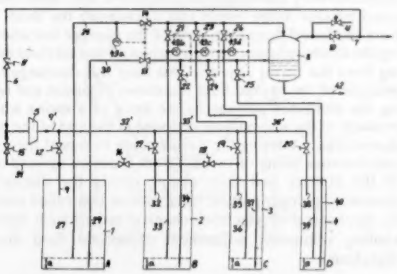


In abstract, the present invention relates to a ball bearing dispenser comprising a gun type frame structure; a bearing storage chamber mounted on said frame structure; a metering chamber disposed adajcent said storage chamber and adapted to receive bearings therefrom; a dispensing chamber projecting generally forwardly from said metering chamber and adapted to receive a select quantity of bearings therefrom; and an actuating trigger assembly normally set to allow the metering chamber to be filled with a select quantity of bearings from said storage chamber and operative upon actuation to release the select quantity of bearings contained in said metering chamber.

3,831,811
METHOD OF AND SYSTEM FOR THE EMPTYING OF LIQUEFIED-GAS VESSELS, ESPECIALLY THE TANKS OF A TANK SHIP

Rudolf Becker, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 26, 1972, Ser. No. 318,161
Claims priority, application Germany, Dec. 29, 1971, 2165388
Int. Cl. B67b 7/00
U.S. Cl. 222—1 8 Claims

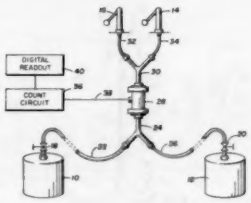


A plurality of liquefied-gas storage or transport tanks, e.g., of a tank ship for carrying liquefied gas, are emptied under applied pressure by introducing a compressed gas into a first tank to drive at least a major portion of the liquefied gas therefrom, the vapor space of the first tank serving as the source of compressable gas to be fed into a subsequently discharged tank as a driving fluid. Consequently, only the last tank remains at a pressure equal to the displacement pressure at the conclusion of emptying of all of the tanks.

3,831,812
FLUID DISPENSING SYSTEM

Albert J. Dolan, Dallas, Tex., assignor to Daltronics International, Dallas, Tex.

Filed Sept. 1, 1972, Ser. No. 285,675
Int. Cl. B67d 5/30
U.S. Cl. 222—20 10 Claims

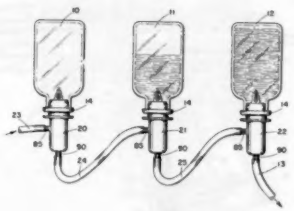


Fluids dispensed in a commercial establishment are metered and/or controlled in accordance with the output of a turbine or vane flow meter in a line interconnecting a fluid bulk container and a dispensing valve. A signal output from the flow meter varies as a sine wave having a periodicity related to flow volume. This sine wave signal is amplified and squared prior to application to a logic circuit responding to the leading edge of each square wave cycle. The logic circuit generates a pulse signal for each cycle of the square wave and these pulses are counted in a digital counter having a numerical display related to the fluid flow through the turbine or vane meter. For control purposes, upon reaching a preselected count in the digital counter, a solenoid is deactivated to close a control valve in the interconnecting line between the bulk container and the dispensing valve.

3,831,813
HIGH-FLOW CAPACITY, SELF-REGULATING BYPASS SPIKE

Allen Latham, Jr., Jamaica Plain, Mass., assignor to Haemonetics Corporation, Natick, Mass.

Filed May 11, 1973, Ser. No. 359,243
Int. Cl. B67b 7/26
U.S. Cl. 222—81 16 Claims

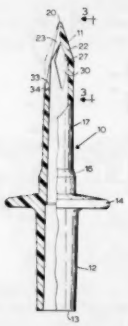


A bypass spike suitable for aseptic insertion through a one-holed stopper into a liquid reservoir for withdrawing liquid at a rapid rate therefrom. The bypass spike is particularly suitable for use in a series of liquid reservoirs from which liquids are to be withdrawn sequentially and in which the vent air of the first of the reservoirs is used as vent air for all the remaining reservoirs.

3,831,814
TROCAR-CANNULA

William F. Butler, Oakland, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed July 25, 1969, Ser. No. 844,946
Int. Cl. G07f 11/00
U.S. Cl. 222—81 9 Claims

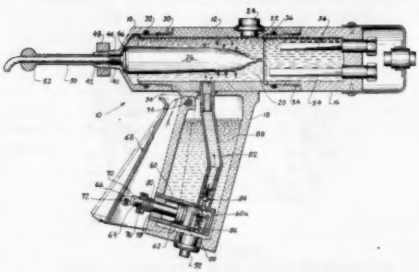


A trocar-cannula for piercing a venoclysis diaphragm. A piercing point is provided on the end of a trocar, providing three large openings for passage of fluid into the interior of the cannula tube, as defined by three ribs shaped to provide maximum size of openings, to minimize cutting or tearing action on the diaphragm, to maximize stretching action thereon, and to prevent possible collapse of part of the container from closing off the opening area. Also, a combination trocar-cannula-drip barrel unit is shown.

3,831,815
DENTAL WAX EXTRUDER

Paul J. Glasgow, Woodmere, N.Y., assignor to Glasgow Products, Inc., Woodmere, N.J.

Filed Nov. 9, 1972, Ser. No. 305,180
Int. Cl. B65d 35/22
U.S. Cl. 222—94 11 Claims

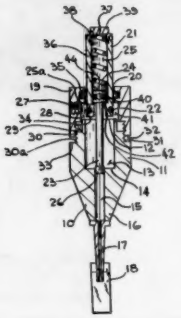


An instrument for heating and extruding dental impression wax or compound and other thermoplastic materials packed in collapsible containers. Heated and pressurized hydraulic fluid is applied to the containers to heat and extrude their contents.

3,831,816
CHEMICAL SYRINGE

Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130

Filed June 29, 1973, Ser. No. 374,983
Int. Cl. B67d 5/56
U.S. Cl. 222—135 12 Claims



A device with improved accuracy, repeatability and reliability in collecting a first fluid such as samples of blood in a syringe or other fluids of various volumes in a dispenser, including volumes of a few lambdas and up to a few ounces, and mixing first fluid volume with a second fluid volume ideally measured in quantities of multiples of 1 to 1,000 times the first fluid volume, which operates by means of a built-in positive displacement with cut-off by a reciprocating plunger containing a telescoping spring loaded piston rod assembly and entering a barrel filled with second fluid with provision of collecting a first fluid by suction into a receiver such as pipette through an elongated passage at the barrel end which can also serve as receiver for the first fluid, simultaneously the plunger moves up from the first discharge position to the second filling position. incorporating a means of filling the barrel only when the plunger is at the barrel top and the barrel is under partial vacuum until the plunger seal disengages the barrel rim to enter larger diameter end cap portion connected to a second fluid supply permitting an instantenous barrel filling with second fluid and means for control of volumetric displacement by cut-off when plunger starts to descend closing the barrel rim by the plunger seal and subsequently during downstroke pressurizing second fluid trapped in the barrel to simultaneously disengage the piston rod end from the elongated passage at the barrel end discharging the fluids mixed from the barrel during descend of the plunger and also washing the discharge passage with surplus of second fluid exhausting from the barrel after the first fluid was discharged under pressure of the second fluid therefrom by piston rod reentering the elongated passage by the force of a spring when the pressure of the second fluid dropped at the end of the plunger downstroke rendering the device ready to repeat the cycle of simultaneous filling of two different fluids on upward motion of the plunger and their mixing during the discharge on downward plunger motion, such motion controlled externally by mechanical or electromechanical means such device including volumetric adjustment of second fluid discharge therefrom.

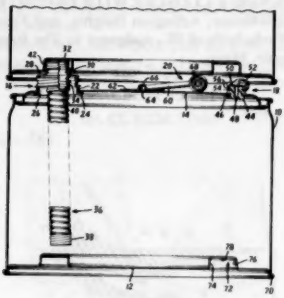
3,831,817
STACKABLE LIQUID CONTAINER WITH POUR SPOUT

Vincent L. Leccese, Homerville, Ga., assignor to Standard Container Company, Montclair, N.J.

Filed Feb. 13, 1973, Ser. No. 332,190
Int. Cl. B65d 21/02
U.S. Cl. 222—143 10 Claims

A liquid container has formed in its bottom wall an annular recess having a radius from the axial centerline of the con-

tainer equal to the radial distance from centerline of a pour spout mounted in the top wall of the container. A carrying handle is mounted on the top wall, having a height which, added to the depth of the recess, equals the height of the pouring spout above the top wall. When these containers are stacked, the upper can is supported by the handle of the bottom can and by the pouring spout of the bottom can extending into the recess in the bottom wall of the upper can and bearing against its floor.



3,831,818

FERTILIZER DISTRIBUTOR

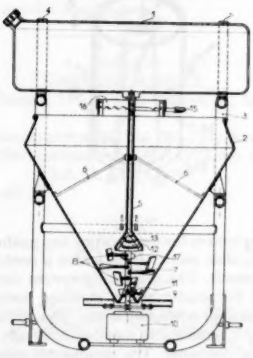
Jacques Dumont, Saverne, France, assignor to Kuhn S.A., Saverne, France

Filed May 3, 1973, Ser. No. 356,794

Claims priority, application France, May 15, 1972, 72.17964

Int. Cl. B67d *5/60*

U.S. Cl. 222—145 **11 Claims**



The disclosure is of a fertilizer distribution device comprising a fertilizer-holding hopper, a reservoir for liquid, a bell-mouthed-conduit for leading the liquid inside and close to the bottom of the hopper, a power-driven rotary stirrer extending up into the bell mouth of the conduit, a clearing spiral on the stirrer for drawing wetted fertilizer out of the said bell mouth, openable shutters controlling openings for the discharge of wetted fertilizer, and means for manually controlling the said shutters and the rate of flow of liquid.

3,831,819

BUILDING ELEMENT ALIGNER AND MORTARIZER

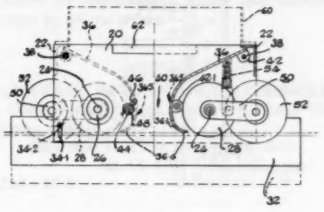
Gordon Norman Bloom, 499 Ontdekkers Rd., Florida Hills, Transvaal Province, Roodepoort, South Africa

Filed Oct. 2, 1972, Ser. No. 294,265

Claims priority, application South Africa, Oct. 4, 1971, 71/6610

Int. Cl. B67d *3/00*

U.S. Cl. 222—176 **4 Claims**



A method to aid in the construction of walls of bricks or other building elements providing for laying the building elements in random alignment in a course on a layer of mortar, alignment of said building elements with side faces of the wall being built and at the same time applying a layer of mortar on the aligned building elements for the next course of randomly aligned building elements, said aligning and mortar application being by a machine adapted for running on said randomly laid and the aligned and mortared building elements. The machine for applying the method comprises a mortar container having a downwardly diverging mortar outlet, spaced aligning devices and supporting runners which are disposed on opposite sides of the outlet.

3,831,820

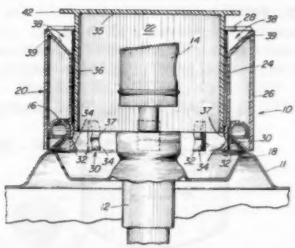
CHILDPROOF SAFETY CAP FOR A PRESSURIZED DISPENSER

John Richard Focht, Yonkers, N.Y., assignor to Precision Valve Corporation, Yonkers, N.Y.

Filed Apr. 17, 1972, Ser. No. 244,670

Int. Cl. B67d *5/32*

U.S. Cl. 222—182 **4 Claims**

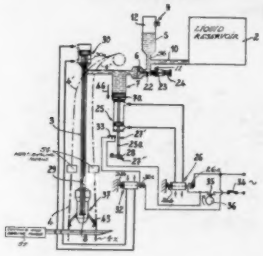


An aerosol safety cap for an aerosol container including inner and outer telescoping members. The outer member includes depending movable locking means which move into conformity with the interior of the annular bead of the mounting cup of an aerosol container when engaged by the telescoped inner member to lock the members in position. Means is provided for gaining access to the inner member to release the locking means.

3,831,821
METERING DISPENSER FOR FLOWABLE MATERIAL

Louis Doyen, Lyon, France, assignor to Thimonnier & Cie, Lyon, France

Filed Apr. 9, 1973, Ser. No. 349,050
Int. Cl. B65b *9/12*
U.S. Cl. 222—255 **11 Claims**

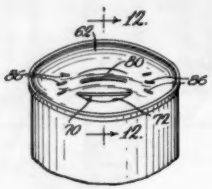


A dispenser for periodically discharging a metered quantity of a liquid or other flowable medium from an outlet, e.g. into a series of containers successively formed from a surrounding plastic sheath, includes two valves in tandem in a conduit extending from a reservoir to the outlet. A first branch of the conduit, upstream of the first valve, communicates with a pressure accumulator while a second branch, between the two valves, forms a metering chamber provided with a piston whose discharge stroke is initiated by a timer substantially concurrently with the opening of the normally closed second valve and closure of the first valve which reopens upon the succeeding intake stroke. The second valve, adjacent the outlet, is reclosed by the piston toward the end of its discharge stroke. The storage capacity of the pressure accumulator is less than the pumping capacity of the metering piston to avoid extended residence of any liquid in the accumulator.

3,831,822
SAFETY AEROSOL CAN

Arthur P. Zundel, Mt. Prospect, Ill., assignor to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 262,050, June 12, 1973, Pat. No. 3,724,727. This application Mar. 22, 1973, Ser. No. 344,057The portion of the term of this patent subsequent to Apr. 3, 1990, has been disclaimed.
Int. Cl. B65d *83/14*
U.S. Cl. 222—397 **21 Claims**

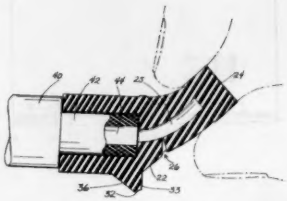


The invention disclosed here relates to a safety vent for pressurized containers consisting of a relief pressure area in a wall of the container with crowning means within the relief pressure area that produces a crown when the pressure in the container exceeds a predetermined safe limit. The relief pressure area is defined by a pair of spaced, weakened portions that are separated from each other by unweakened portions. In one embodiment the crowning means is a bead that extends generally parallel to the weakened portions and in another embodiment a plurality of weakened lines extending generally normal to the weakened portions define the crowning means.

3,831,823
OPENABLE CLOSURE WITH DRIP SITE

Daniel M. McWhorter, Arlington Heights, and Frank K. Villari, Oak Park, both of Ill., assignors to The Rendall Company, Walpole, Mass.

Filed June 3, 1970, Ser. No. 42,978
Int. Cl. B65d *5/74*
U.S. Cl. 222—490 **1 Claim**

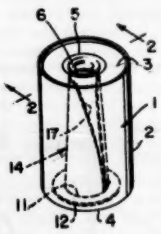


An opening in the form of a slit in the resilient wall of a hollow conduit has a skeg-like protuberance associated with it which tends to collect liquid flowing from said slit and thereby confine its flow off said conduit from a single site.

3,831,824
DISPENSING SYSTEM

Morris Coppersmith, Laverock, Pa., assignor to Packaging Aids Inc., Erdenheim, Pa.

Filed June 8, 1972, Ser. No. 260,860
Int. Cl. B67d *3/00*
U.S. Cl. 222—525 **12 Claims**



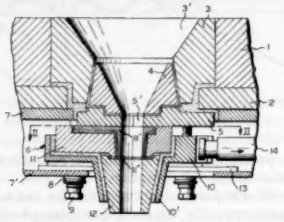
A dispensing system for transporting and guiding the flow of liquid or particulate matter from within a container to some external receptacle. The dispensing system includes a container and a retractable spout member normally located within the container when not in use. The container forms a closure having a removeable member integrally formed on a top wall of the container. The removeable member may be displaced with respect to the top wall along a pre-weakened contour outline thus forming an opening in the top wall of the closure. The spout member may be extracted from within the container through the opening to permit guidance in the pouring of matter from the container. The spout is trough shaped in a substantially conical form. The spout further includes a flange formed on a bottom end which has a greater dimension than the opening to prevent the spout from completely falling through the opening when the container is tilted. A lip formed on an upper end of the spout permits the spout to be manually pulled through the opening in the container.

3,831,825

SLIDING VALVE FOR A CONTAINER OF LIQUID SMELT PROVIDED WITH A LIP

Hans-Joachim Kutzer, Wiesbaden-Rambach, Germany; Gerolf Strohmeier; Bernd Natter, and Karl Sedlatschek, all of Reutte, Austria, assignors to Didier-Werke A.G., Wiesbaden, Germany and Metallwerk Plansee Aktiengesellschaft & Co. KG., Tirol, Austria

Continuation of Ser. No. 57,431, July 23, 1970, abandoned.
This application Sept. 14, 1972, Ser. No. 288,978
Claims priority, application Germany, July 23, 1970, 1937742
Int. Cl. B22d 37/00
U.S. Cl. 222—561 6 Claims



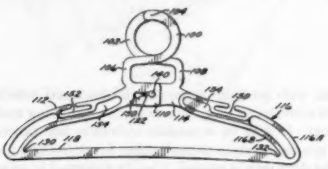
A sliding valve for a container provided with a lip containing a liquid smelt such as a pouring ladle has an orifice plate mounted on the container in the area of the lip. A valve plate has a flow passage and means are provided for moving the valve plate with a sealing effect against the orifice plate. The valve plate is of refractory material and the flow passage and sealing surface of the valve plate are made of a heat resistant metallic hard material, such as an oxidation stable metal silicide with a high melting point. The flow passage and the sealing surface of the valve plate may be made of a heat resistant powder metallurgical solid solution, such as a solid solution containing zirconium oxide and molybdenum. Up to 40 percent by volume chromium may be added to the metal phase of the powder metallurgical solid solution. The flow passage and the sealing surface of the valve plate may have a coating of a heat resistant metallic hard material.

3,831,826

GARMENT HANGER

Leonard L. Thomas, 375 N. West Cypress St., Orange, Calif. 92668

Continuation-in-part of Ser. No. 263,727, June 8, 1972, abandoned. This application Aug. 10, 1972, Ser. No. 279,398
Int. Cl. A47j 51/098
U.S. Cl. 223—88 5 Claims



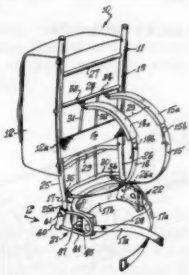
A garment hanger is disclosed which includes two oppositely directed hanger hooks. The hooks are biased in overlapping condition so that the hanger will not be pulled from the rod as an incident to removal of adjacent hangers and which cannot be jostled off of the rod on which it is placed. A biasing arrangement urges the hooks to overlapping relationship and a means is provided for overcoming that bias to move the hooks apart so that it can be installed on and removed from a rod by a vertical movement. In preferred form the hanger is made of wire which has sufficient resilience so that portions of the wire will yield to an operating force to permit opening of the hook and which will return the hooks to original overlapping condition when the force is removed. The hangers shown are the type that include a yoke that fits into the shoulders of a garment placed on the hanger and the hooks extend upwardly from the upper, inner ends of the yoke halves so that they will extend out of the neck of a garment hung on the hanger. An interlocking arrangement in that connection between yoke and hooks serves to lend rigidity to the hanger and to provide an easy means for operating the hooks while permitting the hooks to open by pivotal action.

3,831,827

PACK FRAME WITH SWIVELING HIP-RIDERS

Allan M. Olson, Whittier, Calif., assignor to Camp Ways Inc., Los Angeles, Calif.

Filed Nov. 16, 1972, Ser. No. 307,033
Int. Cl. A45f 3/10
U.S. Cl. 224—25 A 1 Claim



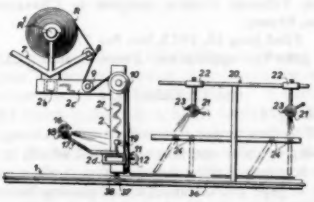
A pack frame assembly combining a pack frame and a suspension means which permits a restricted movement of the pack frame as it is carried on the back of a walking person, which suspension means includes in combination: a pair of flexible shoulder straps attached to the pack frame; and right and left swiveling cantilever arms projecting horizontally from the lower ends of the pack frame to a hip belt, said cantilever arms being pivotally attached to the hip belt.

3,831,828

ARRANGEMENT FOR ALIGNING FABRIC MATERIAL DURING ROLLING-UP AND UNROLLING OPERATIONS

Rene Royon, 15 rue de la Charriere, 4227 Saint Priest en Jarez, and Georges Thillardon, 29 rue des Villas, Residence "Les Edelweiss" 42100 Saint Etiene, both of Loire, France

Filed Feb. 14, 1973, Ser. No. 332,303
Claims priority, application France, Feb. 22, 1972, 72.6947
Int. Cl. B65h 25/26
U.S. Cl. 226—16 20 Claims



An arrangement for aligning sheet fabric material while being rolled up or unrolled for processing, in which the fabric

is passed over an aligning roll member. One end of this roll member is pivoted, whereas the other end is displaced by a screw mechanism. The angular disposition of the roll member orients the material in predetermined direction. In conjunction with the angular variation of the roll member, the peripheral diameter of the roll member may be varied by rotating a shaft passing through the center of the roll member. A pair of oppositely-threaded portions on this shaft, mesh with female-threaded members carrying elongated elements which vary the peripheral diameter of the roll member as a function of the displacement of the female-threaded members along the axis of the shaft.

3,831,829

COPY MACHINE FEEDING MEANS

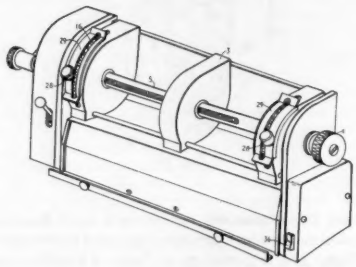
Ladislav Stephan Karpisek, Caringbah, Australia, assignor to Nashua Australia PTY Limited, St. Leonards, New South Wales, Australia

Filed May 14, 1973, Ser. No. 359,664

Claims priority, application Australia, May 16, 1972, 8966/72

Int. Cl. G03b *1/24*

U.S. Cl. 226—83 **5 Claims**



In one form of the invention there is provided a new and improved paper feeding apparatus for photo copying machines and more particularly a paper feeding apparatus for the continuous feeding and copying of computer type continuous paper on flat bed photo copying machines, comprising a main tray assembly for attachment to the underside of a conventional photo copying machine, a paper storing and dispensing tray for attachment to the main tray on one side of a photo copying machine, a drive means situated on the main tray and electrically connected through the machine to move the paper to be copied to and from the copying glass, and a paper receiving tray for receiving the copied paper.

3,831,830

THREAD FEEDING DEVICE FOR TEXTILE MACHINES

Jean Venot, Villerest, France, assignor to Chavanoz S.A., Chavanoz, France

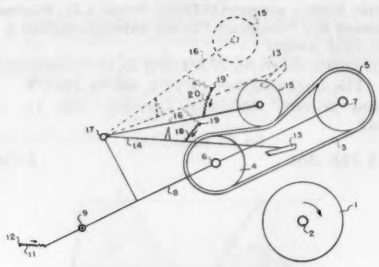
Filed June 18, 1973, Ser. No. 370,725

Claims priority, application France, June 26, 1972, 72.23274

Int. Cl. B65h *17/34*

U.S. Cl. 226—171 **11 Claims**

A thread feeding device for textile machines comprising a rotary driving cylinder and an endless belt which, in normal operation, is applied along an arc of a circle against the cylinder to engage and advance thread passing between the belt and the cylinder wherein the belt is mounted on two idler rollers attached to a pivotable supporting arm, characterized in that the supporting arm is combined with means for positioning and pretensioning the belt in an intermediate position between an idle and a working position in which position the belt is in contact with the driving cylinder over an embraced



arc and at a pressure much less than that necessary to advance the thread during normal operation.

The invention is particularly adapted for use in texturizing machines, and especially, for those texturizing by false twist.

3,831,831

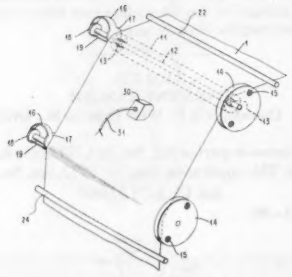
DATA WEB GUIDING APPARATUS

George Burdine Flippen, Jr., and John Wesley Ward, Jr., both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1973, Ser. No. 364,761

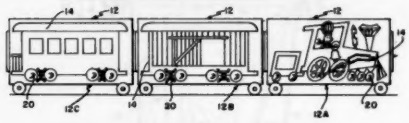
Int. Cl. B65h *23/32*

U.S. Cl. 226—198 **5 Claims**



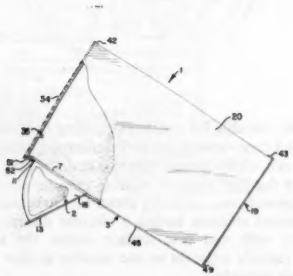
A data web guiding apparatus is disclosed which allows precision movement of a data web past a reading and writing transducer. A pair of rotatable cylinders are positioned in parallel spaced relation to each other for defining a plane over which the data web is passed. Fixedly mounted in spaced relation to a first end of each of these cylinders is a flange. At the other end of each of these cylinders is mounted a spring rail. The spring rails contact an edge of the data web and bias the web toward the fixed flanges as the web passes over the cylinders. When magnetic tape is used as the data web, precision movement of the tape past the guiding apparatus is achieved, in spite of variations in tape width due to temperature, humidity, or uneven cutting of the edges, with edge wear being held to a minimum under all such conditions.

3,831,832
CONNECTABLE BOX STRUCTURES
Joseph Roy Gray, Rt. 3, Box 139, Bixby, Okla. 74008
Filed May 8, 1972, Ser. No. 251,328
Int. Cl. B65d 5/00
U.S. Cl. 229—8 3 Claims



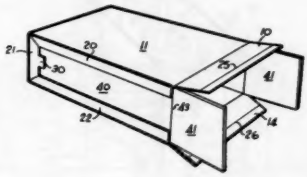
This invention relates to box structures and, more particularly, to box structures connectable in such a manner to form a chain of interconnected structures. More, particularly, this invention relates to box structures which are connected through magnetic members so as to simulate the appearance of interconnected cars of an elongated train assembly. The magnetic members may be mounted interiorly or exteriorly of the box structure which, in turn, may have wheel support assemblies for contact and ease of movement on the support surface.

3,831,833
DISPENSING CARTON
Thomas C. Dressler, c/o John Paluga, 507 Lamar St., Apt. 142, Arlington, Tex. 76010, and Thomas J. Arnold, 4924 Mohawk, Shawnee Mission, Kans. 66205
Filed Sept. 25, 1972, Ser. No. 291,562
Int. Cl. B65d 5/76
U.S. Cl. 229—17 M 2 Claims



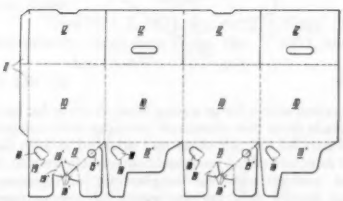
A container or carton for the storage and dispensing of particulate or granular dry flowable materials such as soap powder, cereals, powdered milk, soap flakes and the like. The carton includes a hinged spout that moves in an opening of the container and has a chamber of preselected volume. The spout normally closes the opening and the chamber is filled by manipulating the carton and returning it to an upright position. Movement of the spout to a dispensing position closes the opening and permits tilting of the container for pouring out the chamber contents.

3,831,834
END OPENING CONTAINER WITH IMPROVED STACKING STRENGTH
John R. Elward, Novato, Calif., assignor to Fibreboard Corporation, San Francisco, Calif.
Filed Apr. 9, 1973, Ser. No. 349,205
Int. Cl. B65d 5/32
U.S. Cl. 229—23 R 4 Claims



An end opening, end loading container of three-piece construction has strengthened side and end walls, thereby providing improved stacking strength while using a minimum amount of material.

3,831,835
PACKING CASE FOR RECEPTION OF TETRA-HEDRON-SHAPED INDIVIDUAL PACKINGS AND AN APPARATUS FOR PILING UP THE INDIVIDUAL PACKINGS IN THE PACKING CASE
Horst Guhl, Northeim, Germany, assignor to Firma Thimm Wellpappen KG, Northeim, Germany
Filed July 7, 1972, Ser. No. 269,813
Claims priority, application Germany, July 7, 1971, 2133826; July 7, 1971, 7126064; May 29, 1972, 7220155
Int. Cl. B65d 5/02
U.S. Cl. 229—37 R 12 Claims

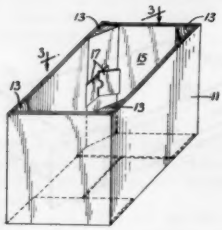


A packing casing formed of a folding cardboard blank with rectangular, in particular square cross-section for reception of tetra-hedron-shaped individual packings, in particular soft packings, which comprises a blank including bottom- and cover-flaps. Guide members are also provided. The bottom flaps form the bottom of the packing casing and defining perforations in the corner ranges for the passage through of the guide members controlling the piling up of individual packings. The individual packings have setting edges and are guided during this piling up and at least parts of the perforations are disposed tangentially to the setting edges.

3,831,836
CONTAINER HAVING CORNER POST HOLDERS

Donald E. Ellison, Clayton, and Larry C. Davenport, Indianapolis, both of Ind., assignors to Inland Container Corporation, Indianapolis, Ind.

Filed Dec. 4, 1972, Ser. No. 311,940
Int. Cl. B65d 61/00
U.S. Cl. 229—49 9 Claims

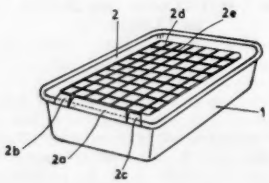


A container having corner post holders formed from a corrugated fiberboard liner which is laminated to the interior surface of the container outer blank. The holders are tabs which are pulled inward to position the corner post behind them.

3,831,837
COVER WITH OPENING TAB FOR CONTAINERS, IN PARTICULAR EATING BOWLS

Rudolph Finger; Erich Berg, and Heinz Schuppstuhl, all of Plettenberg-Ohle, Germany, assignors to Ohlen Eisenwerk Theob. Pfeiffer, Plettenberg-Ohle, Germany

Filed Sept. 11, 1972, Ser. No. 287,654
Claims priority, application Germany, June 6, 1972, 2227472
Int. Cl. B65d 5/72, 17/24
U.S. Cl. 229—51 TS 8 Claims



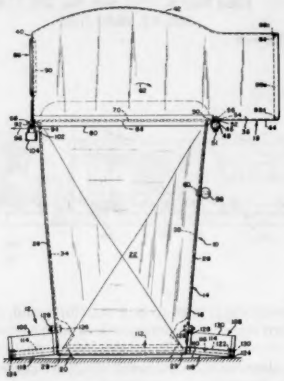
Cover construction for an eating bowl. A cover for an eating bowl is made from thin aluminum provides with corrguations arranged parallel to each other and oriented in both the longitudinal direction of the bowl and transversely thereto. In one preferred embodiment the longitudinal corrugations are somewhat deeper than are the transverse corrugations. An opening tab is preferably provided at one longitudinal end of the cover to initiate opening of the bowl by tearing of said cover.

3,831,838
RECEPTACLES FOR LITTER AND THE LIKE

Robert H. Kline, and Christian E. Grosser, both of Richmond, Va., assignors to Peli-Can, Inc., Richmond, Va.

Filed Mar. 2, 1971, Ser. No. 120,184
Int. Cl. B65d 91/00
U.S. Cl. 232—43.2 4 Claims

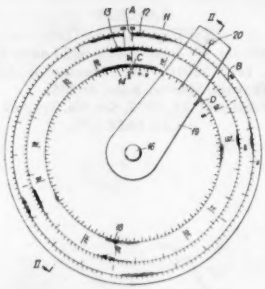
Receptacles for litter and the like which include a base, an outer housing supported by the base, and a disposable container in the outer housing. The outer housing is constructed so that litter, etc. can be introduced through it into the disposable container and so that the disposable container can be readily removed and replaced when it is full.



3,831,839
RACING CALCULATOR

Albert Boardman, 140 Chaldon Way, Coulsdon, England

Filed Dec. 9, 1971, Ser. No. 206,471
Int. Cl. G06c 3/00, 27/00
U.S. Cl. 235—88 9 Claims



A device suitable for use in comparing the form ratings of runners in a race, comprising two elements relatively rotatable about an axis, each element having a scale bearing surface, the surface of the first element bearing circular time and rating scales disposed concentrically about said axis and the surface of the second element having a circular distance scale also concentric with said first surface scales, the scales being disposed radially adjacent to one another so that they can be read simultaneously.

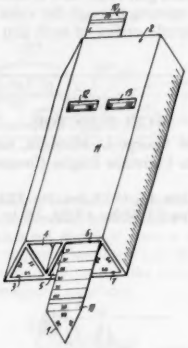
3,831,840
COMPOSITE SLIDE RULE

Pierre Faucheux, Paris, France, assignor to Etablissement Fresa, Vaduz, Liechtenstein

Filed Feb. 28, 1973, Ser. No. 336,622
Claims priority, application Switzerland, Mar. 1, 1972, 3015/72
Int. Cl. G06c 3/00
U.S. Cl. 235—89 R 1 Claim

A composite slide rule showing for different type breadths defining the number of characters in a printed line the number

of characters printed for various numbers of lines printed with such types. Advantageously, there is provided an elongated casing with a plurality of parallel channels the cross-section of which is preferably in the shape of a regular polygon such as an equilateral triangle, these channels slidingly housing



prismatic slides of a corresponding cross-section, the sides of which carry each along its opposite edges cooperating scales of character and line numbers for a predetermined type breadth. This allows reading, through gates extending through the casing, the corresponding character and line figures for the selected character breadth.

3,831,841

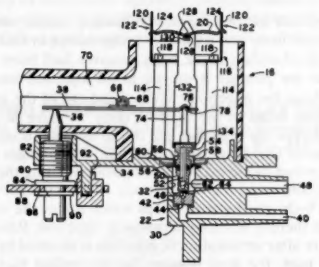
TEMPERATURE CONTROL SYSTEM AND VACUUM MODULATOR VALVE THEREFOR

Rudolph J. Franz, Schaumburg, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 30, 1974, Ser. No. 438,507

Int. Cl. B60h *1/02*; **G05d** *11/16, 23/275*

U.S. Cl. 236—13 **7 Claims**



Apparatus is provided for controlling a vacuum motor to regulate the position of an air blend door in an automotive air conditioning system. The apparatus includes a sensor and an aspirator spaced apart from the sensor, with the outlet of the sensor in fluid communication with the aspirated-air inlet of the aspirator. The sensor includes a valve casing, a vacuum supply line, and a vacuum control line connected to the vacuum motor. Valve means is provided within the valve casing so that the vacuum supply line and the vacuum control line are in open communication when the valve means is open. The sensor has a bimetal element mounted in the flow of air at in-car temperatures and an adjustment arm which are independent of each other, but in operative association with the valve means to effect movement thereof.

3,831,842

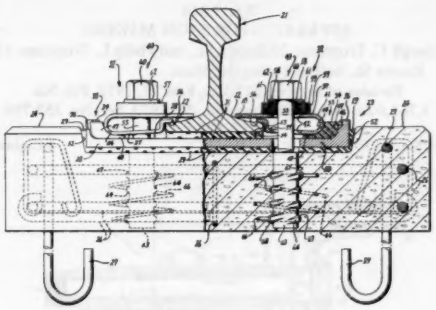
RAIL FASTENING DEVICE

Shigeru Tamura, Tokyo, Japan, assignor to George J. Mura, San Leandro, Calif.

Filed Nov. 2, 1972, Ser. No. 303,226

Int. Cl. E01b *9/66*

U.S. Cl. 238—349 **15 Claims**



A rail fastening device for securement of a longitudinally extending rail means to support structure by spring clip means is disclosed. A rail alignment means, including wedge means, mounted in engagement with the spring clip means and formed to laterally displace the spring clip means, and accordingly the rail means, is provided to enable precise alignment of the rail means and the gauge between adjacent rails. The spring clip means is free for lateral movement, as is the rail, and the alignment means is used to support lateral loading forces as well as align the rail means. The wedge means is formed of electrically insulating material, as is a pad under the rail and sockets into which fasteners for the spring clips are mounted, to insulate the rail means electrically from the supporting structure. A rail fastening device for tracks with and without ballast is shown as well as specific spring clip configurations and a locking washer for the spring clips.

3,831,843

METHOD OF FUEL ATOMIZATION AND A FUEL ATOMIZER NOZZLE THEREFOR

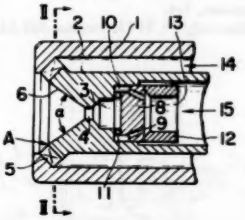
Tadahisa Masai, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 3, 1972, Ser. No. 231,702

Claims priority, application Japan, Mar. 3, 1971, 46-10653

Int. Cl. A01n *17/02*; **A62c** *1/12*

U.S. Cl. 239—8 **7 Claims**



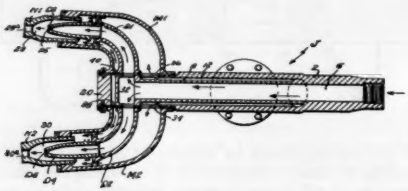
A very fine fuel particle size is obtained by atomization resulting from the intersection of a fuel stream from a fuel nozzle and a gas stream from a gas nozzle with respective velocity vectors forming an angle at least as great as 90°, with atomization of an inverse Y-jet type. Preferably, the fuel is

jetted with a whirling motion in an axial direction away from the atomizer, and the gas is whirled inwardly at right angles to its whirling axis or axially either in the same direction as or in the opposite direction as the axial direction of movement for the fuel. The fuel and preferably also the gas will be whirled conically, that is with both a radial and axial component of movement with respect to the whirling axis.

3,831,844
APPARATUS FOR SNOW MAKING

Joseph C. Tropeano, 20 Revere St., and Philip L. Tropeano, 12 Revere St., both of Lexington, Mass.

Division of Ser. No. 227,126, Feb. 17, 1972, Pat. No. 3,761,020. This application Apr. 30, 1973, Ser. No. 355,799
Int. Cl. F25c *3/04*
U.S. Cl. 239—14 **4 Claims**

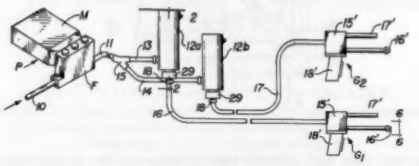


High velocity streams of compressed air and pressurized water are furnished in a cold ambient atmosphere from two independent sources of supply and precooled by momentarily confining the high velocity streams in elongated passageways formed in a snow-making jet construction whose outer surfaces are exposed to the cold ambient atmosphere. Portions of the passageways in the jet structure are arranged in a manner such that the stream of water is precooled by the cold ambient atmosphere and an inner stream of compressed air undergoes peripheral precooling by means of the precooled stream of pressurized water. The precooled stream of air may undergo successive stages of expansion while in a confined state to further cool the mixture. Regulated quantities of the precooled compressed air may also be injected into the confined stream of water at predetermined points thereby to control snow characteristics. Precooling compressed air and water with the jet construction of the invention produces snow at efficiency levels not heretofore realized in the art of snow making, and the characteristics of the snow crystals or particles being desirably controlled.

3,831,845
FLUID DELIVERY SYSTEM

Amos Pacht, Houston, Tex., assignor to Partek Corporation of Houston, Houston, Tex.

Filed Aug. 17, 1973, Ser. No. 389,244
Int. Cl. F16k *21/00*
U.S. Cl. 239—76 **13 Claims**

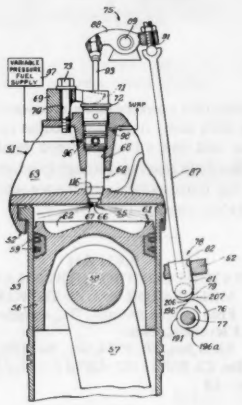


A high pressure fluid delivery system is disclosed in which two or more guns, each having a high pressure nozzle outlet and a low pressure dump outlet, may be connected to and operated from the same pump. Pressure responsive control apparatus is provided in the flow line between each gun and the pump and each such apparatus includes a valve responsive to the fluid pressure at its respective gun for directing fluid either directly to such gun when flow is through the gun nozzle, or through an opening through the valve substantially the same size as the nozzle orifice of such gun when the gun is dumping.

3,831,846
FUEL INJECTOR

Julius P. Perr, and George L. Muntean, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jan. 15, 1973, Ser. No. 323,624
Int. Cl. F02m *47/02, 45/10*
U.S. Cl. 239—89 **35 Claims**



A fuel injector for an internal combustion engine, comprising an injector body and a plunger reciprocable in said body. An injection chamber in the body receives fuel from a fuel supply, and the plunger is moved in an injection stroke to force fuel from the injection chamber and out of the injector through spray holes in the injector body. A valve in a flow passage between the chamber and the spray holes is normally open to permit fuel flow during injection. The plunger moves the valve toward its closed or seated position during the injection stroke, and when the valve closely approaches the seated position, a hydraulic force develops which forces the valve to its seat and thereby abruptly terminates injection. Release of fuel pressure after termination of injection is attained by opening a spill port, the flow passage for the spilled fuel being restricted in order to obtain a gradual release of the fuel pressure in the chamber. The resulting gradual release of fuel pressure in the chamber holds the valve firmly seated and thus prevents secondary injection.

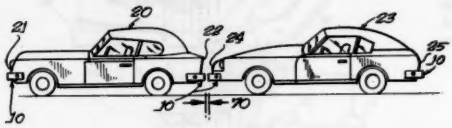
3,831,847
MAGNETIC VEHICLE BUMPER

Daniel J. Serritella, 7757 S. Narragansett, Burbank, Ill. 60459

Filed Apr. 30, 1973, Ser. No. 355,339
Int. Cl. B60r *19/02*
U.S. Cl. 239—1 **5 Claims**

A vehicle bumper consisting of a pair of bracket members adapted for mounting on the chassis of a vehicle in the conventional bumper location thereon, a rigid channel member

adapted for mounting on a bracket in a manner to extend transversely of the vehicle with the rear surface of the channel member adjacent the vehicle body and the front surface of the channel member projecting away from the vehicle body, a segmented magnetic member extending longitudinally across the front surface of the channel member with each of the mag-



netic segments having the same magnetic pole face portion facing in a forward direction substantially flush with the front surface of the channel member, and a cover adapted for slipping over the magnetic members and channel member and secured thereover by bolts or the like in a manner to protect the channel and magnetic members.

3,831,848

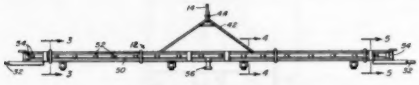
SPRAY BAR WITH GUIDE WHEELS AND STABILIZING POLES

Henry D. Cook, Atlanta, Ga., assignor to K & M Enterprises, Incorporated, Atlanta, Ga.

Division of Ser. No. 202,869, Nov. 29, 1971, Pat. No. 3,750,686. This application May 18, 1973, Ser. No. 361,851

Int. Cl. B05b *9/02, 1/28, 15/06*

U.S. Cl. 239—104 **2 Claims**



An elongated spray bar adapted to be suspended from a cable or the like along the side of a building and including a plurality of nozzles for spraying cleaning solution, a plurality of guide wheels for guiding vertical movement of the spray bar and stabilizing poles projecting from each end thereof.

3,831,849

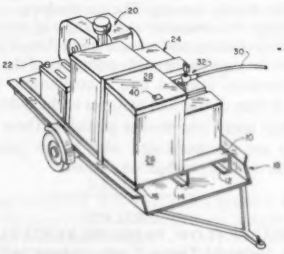
MOBILE SELF CONTAINED PRESSURE SPRAYER

John H. Studinger, 5700 Montview Blvd., Denver, Colo. 80207

Filed June 26, 1972, Ser. No. 266,415

Int. Cl. B05b *9/02*

U.S. Cl. 239—127 **1 Claim**



A skid mounted sprayer assembly having a gasoline engine driving a high pressure pump, includes tanks for fluids ejected by the pump, providing a mobile source of high pressure cleaning and washing fluids.

3,831,850

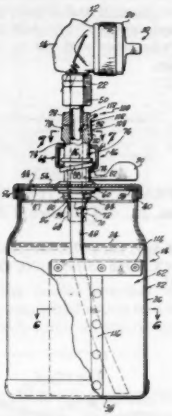
SPRAY GUN ASSEMBLY HAVING STIR MEANS

Theodore K. Hunter, 1107 S. Serenade Ave., West Covina, Calif. 91790

Filed May 30, 1973, Ser. No. 365,256

Int. Cl. B01f *9/08*

U.S. Cl. 239—144 **13 Claims**



A pneumatic spray gun container assembly having a suction tube through which a substance to be sprayed, such as paint, feeds from the container proper of the assembly to the spray gun. A stirrer, such as a flexible paddle, is fixed to the suction tube within the container, and the container is rotatable relative to the tube and stirrer to effect stirring of the container contents periodically during spraying operation without opening the container. A finger operated latch is provided for releasably securing the suction tube and container in a fixed relative angular position between stirrings.

3,831,851

SPRAY INSTALLATION FOR HIGHLY-FILLED DISPERSIONS

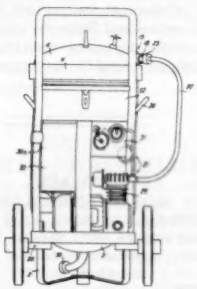
Hans Peter Gsell, Baar, and Friedrich Kunzler, Roggwil, both of Switzerland, assignors to Tirama AG, Zug, Switzerland

Filed Apr. 14, 1972, Ser. No. 244,181

Claims priority, application Switzerland, Apr. 30, 1971, 6455/71

Int. Cl. B05b *7/26*

U.S. Cl. 239—175 **19 Claims**



A spray installation for highly-filled dispersions comprising a pressure container for a dispersion which at its lower end

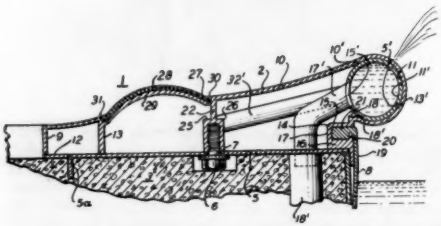
possesses an outlet connection for the dispersion and at its upper end an inlet connection for compressed air. The pressure container further is equipped with a removable cover having a flange bearing against a flange at the container body. The cover is retained at the container body through the agency of a clamping ring closure which engages over the flanges. A compressed air device is connected via a conduit with the inlet connection of the pressure container. There is also provided a blower mechanism and a spray gun. The spray gun is coupled via a dispersion feed line with the outlet connection of the pressure container and via an air conduit with the blower mechanism.

3,831,852

FOUNTAIN SPRAY SYSTEM FOR SWIMMING POOLS

Albert H. Stillman, Jr., 436 Edgewood Ave., Smithtown, N.Y. 11787

Filed Apr. 16, 1973, Ser. No. 351,244
Int. Cl. B05b *15/06, 1/20;* **E04h** *3/20*
U.S. Cl. 239—201 **5 Claims**



A spraying means for spraying water in a fountain effect into a swimming pool is disclosed. Water is pumped through a tubing means positioned inside the coping that surrounds the swimming pool and sprayed out through openings in the coping. These openings may be located completely around the periphery of the swimming pool or at separated locations such as the corners. The openings are flush with the outside surface of the coping so that there are no projections extending beyond the coping. The water is pumped into the spraying means by the pump for the filtering system of the pool. A valve may be provided which is connected to the pump so that some or all of the water which is pumped through the filtering means can be returned to the pool through the spraying system instead of through the normal filtering route. The spraying system aerates and filters the water and also tends to heat or cool the water, depending upon the temperature of the water and the temperature of the sourrounding air.

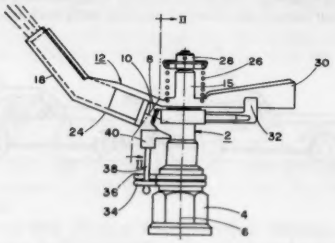
3,831,853

ROTARY SPRINKLERS

Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Mar. 26, 1973, Ser. No. 344,831
Claims priority, application Israel, Dec. 12, 1972, 41070
Int. Cl. B05b *3/08*
U.S. Cl. 239—230 **10 Claims**

A rotary sprinkler of the hammer-type is described wherein the arm of the sprinkler impinged by the jet is oscillatingly mounted on a pivotal axis laterally spaced from the vertical axis of rotation of the sprinkler head such that the impingement of the water jet on the arm produces a rotary torque for oscillating the hammer, while producing relatively little side-



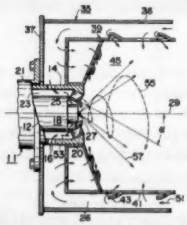
splash. In addition, the portion of the arm impinged by the water jet includes baffles substantially blocking whatever side-splash is produced.

3,831,854

PRESSURE SPRAY TYPE FUEL INJECTION NOZZLE HAVING AIR DISCHARGE OPENINGS

Isao Sato, and Tadahisa Masai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1973, Ser. No. 335,312
Int. Cl. F23d *15/00*
U.S. Cl. 239—406 **6 Claims**



A fuel injection nozzle of the type which injects fuel from a nozzle opening with pressure in the form of a conical spray of fuel particles, in which air discharge openings are provided around the nozzle opening. The air discharge openings each have an angle of inclination and an angle of torsion to the axis of the nozzle opening and cause a spiral flow of air which contacts from the outside the outer periphery of the conical spray of fuel particles injected into a combustion chamber and thereby divides coarse fuel particles at the outer periphery of the conical spray into smaller particles. These air discharge openings are communicated with a flow passage of combustion air inside a combustion element.

3,831,855

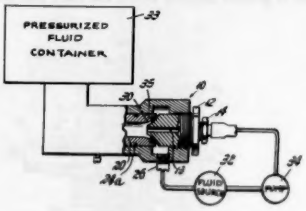
VARIABLE FLOW, PRESSURE VENTURI NOZZLE

Zenon R. Mocarski, Easton, Conn., assignor to S.R.C. Laboratories, Inc., Fairfield, Conn.

Filed June 8, 1973, Ser. No. 368,353
Int. Cl. B05b *7/00*
U.S. Cl. 239—416 **9 Claims**

A venturi type nozzle that uses pressurized fluid to induce

flow of the secondary fluid with the size of the secondary fluid intake being varied in accordance with the difference of pressure existing at the nozzle exhaust and at the secondary fluid intake.



3,831,856

ATOMIZING BURNER

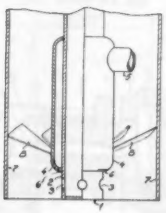
Gunnar Jorgensen, Bagsvaerd, Denmark, assignor to A/S Atlas, Ballerup and F. L. Smith & Co. A/S, Valby, both of, Denmark

Filed Aug. 16, 1973, Ser. No. 389,003

Claims priority, application Denmark, Aug. 28, 1972, 4251/72

Int. Cl. F23d *11/16*

U.S. Cl. 239—422 4 Claims



The invention relates to an atomizing burner, particularly intended for incinerating liquid garbage, and consisting of a supply pipe for the garbage, having circumferentially disposed exits, and being enclosed by an inner jacket through which pressurized atomization medium is supplied, and an outer jacket for supply of air for the combustion, in which burner a number of slots are provided, corresponding to the number of exits for the garbage, and being so designed and positioned adjacent the said exits as to force the pressurized medium from each slot over the adjacent exit for the garbage.

3,831,857

ASPIRATING NOZZLE WITH QUICK CHANGE LINER

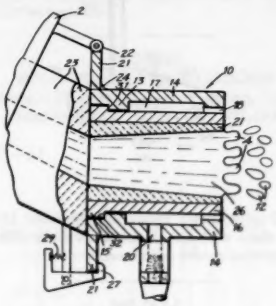
John J. Scott, Niagara Falls, Ontario, Canada, assignor to Norton Company, Worcester, Mass.

Filed June 8, 1973, Ser. No. 368,296

Int. Cl. B05b *7/06*; B22d *37/00*

U.S. Cl. 239—424 5 Claims

An aspirating nozzle assembly for use in the manufacture of solid ceramic spheres from a fused oxide material such as alumina, including a hollow annular outer housing means and a hollow annular inner liner means together forming an annular chamber therebetween with an annular outlet therefrom at the downstream end of the nozzle assembly, said liner means being supported and constrained within said housing means so as to be quickly and easily removed and replaced.



3,831,858

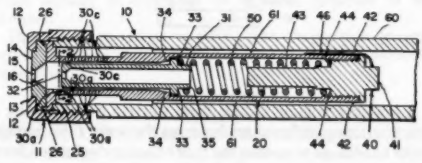
VENTED PLUNGER ATOMIZER

Robert J. Casey, Philadelphia, Pa., assignor to The United States of Ameria as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1973, Ser. No. 337,037

Int. Cl. B05b *1/34*

U.S. Cl. 239—464 9 Claims



Fluid pressure in a variable volume whirl chamber exerts a force that positions a spring biased piston. The positioning of the piston determines the amount of fuel oil supplied to a ship's boiler by an arrangement of ports in a whirl chamber cartridge. The cartridge provides an enclosure for the whirl chamber, a piston and a biasing spring. The fuel is delivered axially along the outside of the cartridge through the ports to the whirl chamber and out an orifice located at the forward end of the whirl chamber.

3,831,859

DISCHARGE MEANS FOR AGRICULTURAL FOAM

Gordon H. Allard, Menomonee Falls, Wis., assignor to Waukesha Foundry Company, Inc., Waukesha, Wis.

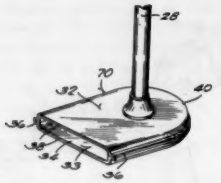
Filed Oct. 19, 1972, Ser. No. 298,890

Int. Cl. B05b *1/04*

U.S. Cl. 239—592 8 Claims

A group of nozzles for discharging foam to cover a surface completely, in which foam is supplied to the nozzle at right angles to the discharge direction and at a substantial distance from any side or end wall of the nozzle to promote uniform pressure and flow. In addition, an improved nozzle support has a lost motion connection to permit the nozzle to follow the

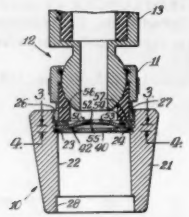
surface, secured with a pin for easy changing of the lateral position, the nozzle being slidable on a pair of beams for vertical and axial adjustment. Plows are provided to cover the edges of the foam with dirt. Sideboards shelter the emerging foam from the wind until it is deposited.



3,831,860
LOW FLOW VOLUME SHOWER HEAD

Gilbert V. Gullaksen, Monee, and George W. Jatho, Oak Lawn, both of Ill., assignors to Wrightway Mfg. Co., Chicago, Ill.

Filed Dec. 18, 1972, Ser. No. 316,042
Int. Cl. B50b *1/34*; **B05b** *1/14*
U.S. Cl. 239—500 **10 Claims**



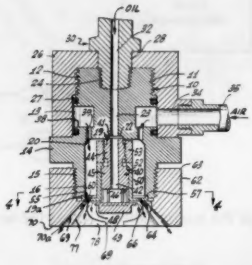
A low flow volume shower head wherein a disk having a flow restricting orifice extends across the water flow passage of the head so as to restrict the flow of water discharged from the head. The flow restricting disk is positioned upstream from a perforated, jet-forming disk that also extends across the flow passage. The area of the orifice in the flow restricting disk is less than the total area of the apertures in the perforated disk by a predetermined amount; the orifice in the flow restricting disk is spaced upstream from the jet-forming disk by a predetermined distance; and the space between the jet-forming disk and a portion of the flow restricting disk having the orifice therein is of a predetermined volume.

3,831,861
LIQUID SPRAY HEAD FOR PRODUCING RECTANGULAR SPRAY PATTERNS

Harold W. Hanson, Jr., Newport Beach, Calif., assignor to Par-Way Mfg. Co., Los Angeles, Calif.

Filed Mar. 23, 1973, Ser. No. 344,074
Int. Cl. B05b *1/02*, *15/04*
U.S. Cl. 239—520 **9 Claims**

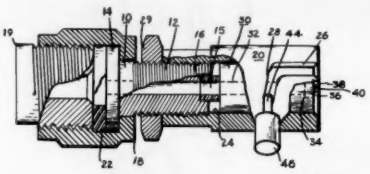
A nozzle for spraying liquids is provided. In a useful example, cooking oil is sprayed into baking pans using a conduit which discharges the oil at a center point between two concentric closely-spaced circular discs, in parallel horizontal planes, the lower disc being smaller than the upper disc, there being a large number of small air passages in a circular pattern extending downwardly through the upper disc, all around the border of the lower disc. The oil flows radially out from between the discs, and is impinged upon by air under pressure issuing downwardly from the air passages. Thereby the oil film is largely atomized and sprayed downwardly. Oil from between the discs not so atomized reaches the internal surface of a conical skirt, and is guided thereby down the skirt and off the lower edge thereof in an atomized condition. A solid cone of atomized oil particles is thereby delivered downwardly in a burst of only a few hundredths of a second. A specially contrived skirt produces a square or rectangular pattern of the sprayed liquid.



3,831,862
SPRAY TIP

Oliver J. Calder, Orange, Calif., assignor to Airless Spray Tip Manufacturing Co., Orange, Calif.

Filed Apr. 11, 1973, Ser. No. 350,184
Int. Cl. B05b *7/02*
U.S. Cl. 239—526 **10 Claims**



There is disclosed an improvement for mounting of a spray orifice in a pressured liquid spray system in which the orifice is carried by a plug member that fits into a tubular housing and locks therein by a sliding bolt action. The plug can be removed and reversed in its position to permit pressured cleaning of obstructions from the orifice. Preferably, a plurality of plugs are provided with different spray orifices to permit a rapid interchanging of the orifice with other orifices having different spray capacities and/or characteristics.

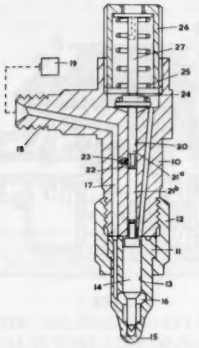
3,831,863
FUEL INJECTION NOZZLES

Ivor Fenne, Middlesex, England, assignor to C.A.V. Limited, Birmingham, England

Filed Jan. 15, 1973, Ser. No. 323,529
Claims priority, application Great Britain, Jan. 15, 1972, 2018/72
Int. Cl. B05b *1/30*
U.S. Cl. 239—533 **2 Claims**

A liquid fuel injection nozzle unit for an internal combustion engine includes a valve member movable towards a seating to prevent fuel flow through an outlet from an inlet the valve member is engaged by a push rod which is subjected to

the fluid pressure in the inlet by way of a non-return valve, the area of the push rod exposed to the fluid pressure being less



than that of the valve member which is exposed to the fluid pressure whereby the valve member will be lifted from its seating to allow flow through said outlet.

3,831,864

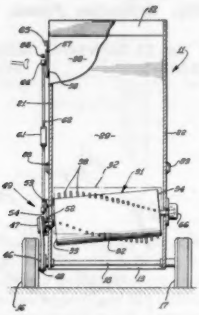
APPARATUS FOR STORING AND DISPOSING OF GRASS CLIPPINGS

Albert W. Ginther, P.O. Box 311, Arcadia, Calif. 91006

Filed June 14, 1973, Ser. No. 369,895

Int. Cl. A01c *17/00*

U.S. Cl. 239—665 **6 Claims**



A grass clipping receptacle and disposal apparatus is provided in the form of a cart or small trailer to be towed behind a small motorized utility vehicle of the type used in the maintenance of golf courses, parks, cemeteries, etc. The apparatus includes an upstanding bin or hopper having an open top into which the clippings are dumped for temporary storage. A rotatable toothed drum is mounted within an open bottom of the hopper to dispense the clippings held therein at a uniform rate. A belt and pulley drive means is provided for rotating the drum in response to movement of the apparatus, and a manually operated clutch mechanism serves to selectively couple or decouple the belt drive so as to dispose the drum in either a rotating or non-rotating mode during vehicle travel. With this apparatus, clippings from a golf green for example may be temporarily stored in the hopper. Thereafter the clutch mechanism is engaged to cause the rotating drum to discharge the clippings during travel to the next green thus disposing of the cuttings by spreading them over the distance between each green. To insure uniform dispensing of the collected clippings, the rotatable drum is provided with a plurality of staggered teeth or pins which project radially outwardly from a cylindrical drum surface to engage and impel the clippings outwardly through the bottom of the hopper. An adjustable gate is provided on the hopper adjacent the rotating drum to selectively change the size of the opening through which the grass clippings are dispensed, such that the rate of discharge can be regulated.

3,831,865

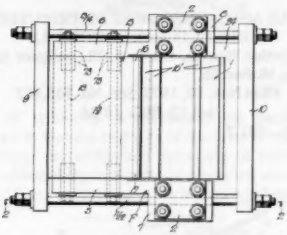
SOLID WASTE TRASH GRINDER

Victor Danberg, 6 Mary Ann Ln., Wallingford, Conn. 06492

Filed Dec. 13, 1971, Ser. No. 207,492

Int. Cl. B02c *18/18*

U.S. Cl. 241—32 **4 Claims**



In a solid-waste chopper, the rotary cutter is fixed and the companion bed cutter is held against a fixed stop by tie rods which under excessive stress from a prohibitive shock load on the chopping cutters will fracture. For interlocking the bed cutter with the fixed stop in normal chopper operation, lock rods transverse to the tie rods extend fittingly through the bed cutter and into abutting frame plates, with these lock rods being sheared at the frame plates under excessive burning stress in the tie rods to thereby release the bed cutter for giving way to a prohibitive shock on the chopping cutters to avoid damage to the latter or to other structure of the chopper.

This invention relates to solid-waste choppers in general, and to choppers with companion rotary and fixed cutters in particular.

3,831,866

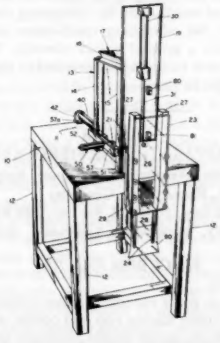
METHOD AND APPARATUS FOR SHREDDING CHEESE

Duane Phillips, Oxford, Wis., assignor to Armour and Company, Chicago, Ill.

Filed Nov. 18, 1971, Ser. No. 200,099

Int. Cl. B02c *23/04*

U.S. Cl. 241—63 **11 Claims**



A method and apparatus for shredding blocks of cheese to fill individual packages each with a predetermined amount of

shredded cheese. In one embodiment the apparatus includes a hopper device for holding a plurality of blocks of cheese in stacked relationship, fluid driven reciprocating mechanism for shredding cheese from the lowermost of these blocks, fluid driven mechanism for pressing the lowermost block in the stack against the reciprocating shredding mechanism with a substantially constant pressure, fluid control mechanism for permitting a next higher block of cheese to fall into place for shredding when the first block being shredded has been expended, and a fluid operated counting device which stops the movement of the reciprocating mechanism when a predetermined number of strokes has been had.

3,831,867

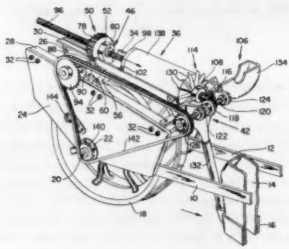
APPARATUS AND METHOD FOR DISTRIBUTING TOXIC AGRICULTURAL CHEMICALS

Harold Valentine Hansen, Cordova, Ill., assignor to Deere & Company, Moline, Ill.

Filed Nov. 10, 1972, Ser. No. 305,502

Int. Cl. B02c *18/26*

U.S. Cl. 241—101.7 **7 Claims**



Apparatus and method for distributing toxic agricultural chemicals such as insecticides or the like, the method comprising the steps of forming granules of the chemical into a shape-retaining solid, applying a thin coating of nontoxic substance to the solid to facilitate handling of the chemical, gradually reducing the solid to its granular form at a rate in relation to the speed at which the solid is moved over the ground, and distributing the granules to the ground as they are removed from the solid. The distributing apparatus comprises a mobile, ground wheel supported frame adapted to advance through a field, a support on the frame for supporting the solid chemical, a cutter for engaging the solid and reducing it to its granular form, and mechanism for advancing the solid toward the cutter, both the advancing mechanism and the cutter being driven from a ground wheel whereby the volume of chemical distributed remains proportional to the speed of the apparatus through the field.

3,831,868

GRINDING APPARATUS FOR FIBROUS MATERIAL

Albrecht Kahmann, Weingarten, Germany, assignor to Escher Wyss G.m.b.H., Ravensburg, Germany

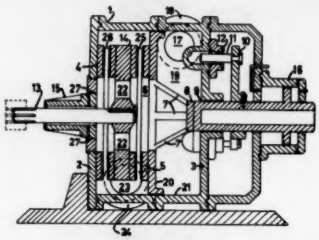
Filed Sept. 14, 1972, Ser. No. 288,945

Claims priority, application Germany, Sept. 17, 1971, 2146549

Int. Cl. B02c *7/02, 7/14*

U.S. Cl. 241—245 **2 Claims**

Grinding device, more especially a disc refiner for the paper industry; in a housing having two end covers is a rotor and a stator which is displaceable axially relatively to the rotor and guided in nonrotatable manner on the housing; the stator provided with a central opening for the throughflow of the stock to be handled in the grinding device; the stator being under a pressure of the stock to be handled in the grinding device also on that wall which is remote from the rotor; the space which lies between that wall of the displaceable stator which is



remote from the rotor and the housing wall is made of substantially cylindrical form and a stock pipe opens tangentially into this space.

3,831,869

HOLDING MEANS FOR YARN WINDING CARRIER WHICH IS TO ROTATE AT HIGH SPEEDS

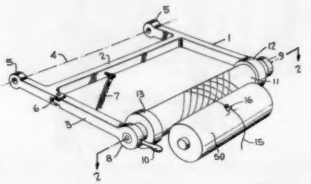
Rolland Sartori, Riorges, France, assignor to Rhone-Poulenc-Textile, Lyon Cedex, France

Filed Sept. 7, 1972, Ser. No. 287,080

Claims priority, application France, Sept. 15, 1971, 71.33480

Int. Cl. B65h *54/42, 54/54*

U.S. Cl. 242—18 DD **9 Claims**



Apparatus for the rotary mounting of a textile yarn winding carrier comprising two members for axially holding the carrier at the extremities of the carrier and at least one supporting surface attached to each member, contacting the external surface of the carrier.

3,831,870

DEVICE FOR WINDING FLEXIBLE ELEMENTS CONNECTED END-TO-END BY A JOINT

Edmond Daniel, Saulx-Les-Chartreux, France

Filed Jan. 18, 1973, Ser. No. 324,804

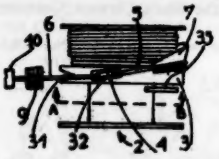
Claims priority, application France, Feb. 1, 1972, 72.03354

Int. Cl. B65h *54/02*

U.S. Cl. 242—18 A **5 Claims**

A device for winding flexible elements connected end-to-end by a joint in which a first drum receives the first element, a

pulley carrying a battle-dore operable to extend over and move with the first drum upon arrival of the joint receives the



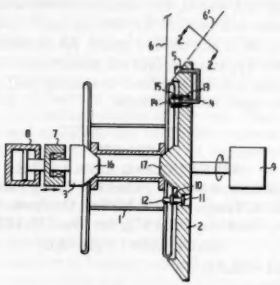
regions of the elements to either end of the joint and a second drum, coaxial with the first receives the second element.

3,831,871

DEVICE FOR HOLDING AND RELEASING THE TERMINAL IN WIRE-LIKE OBJECT TAKE-UP APPARATUS

Yoshio Ikegami, and Tadashi Kohge, both of Kobe, Japan, assignors to Kobe Steel, Inc., Kobe, Japan

Filed May 21, 1973, Ser. No. 362,285
Int. Cl. B65h *54/02, 54/44*
U.S. Cl. 242—25 R **4 Claims**



A device for holding and releasing the terminal of a wire-like object in a take-up apparatus of the wire-like object, wherein a blank bobbin is rotatably supported and is rotated to take up the wire-like object, and the bobbin taking up the wire-like object is replaced with another blank bobbin when it is filled in order to continue the take-up operation, characterized in that when the blank bobbin is being mounted in the wire-like object take-up apparatus, a pawl engageable with the wire-like object is actuated into a condition for holding it, and when the bobbin fully wound with the wire-like object is to be removed from the wire-like object take-up apparatus, the pawl is concurrently released, to thereby allow for automatic handling of the terminal of the wire-like object in the mounting and removal of the respective bobbins.

3,831,872

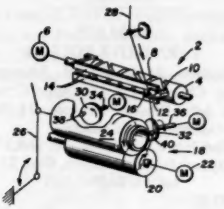
TRAVERSE WINDING APPARATUS

Don E. Fisher; Paul A. Knauff, and David Bowen, Jr., all of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 85,930, Nov. 2, 1970, which is a division of Ser. No. 798,082, Feb. 10, 1969, abandoned. This application Jan. 23, 1973, Ser. No. 325,982
Int. Cl. B65h *54/28*
U.S. Cl. 242—43 **6 Claims**

The invention relates to high-speed yarn traverse winding apparatus, method and product.

Circling thrust members are provided to intercept a yarn being reciprocably traversed and forwarded to a bobbin in a winding zone to acceleratively control the reversal displacement of the yarn on the bobbin. A yarn package having a high



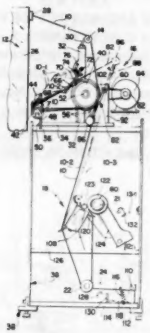
resolution of symmetry is produced, the package being characterized in that the majority of the reversal curves of the helical windings are comprised essentially of camber curves generated substantially to a point of projected intersection of the diagonal linear extensions of the helical windings.

3,831,873

TAKE-UP SYSTEM

William M. Bense, Barrington, R.I., assignor to Leesona Corporation, Warick, R.I.

Continuation of Ser. No. 40,548, May 26, 1970, abandoned. This application June 14, 1972, Ser. No. 262,583
Int. Cl. B65h *51/20, 59/02*
U.S. Cl. 242—45 **7 Claims**



An apparatus is disclosed for taking up one or more strands. The strands are received by a capstan from a strand processing source of supply at a relatively high tension. Each strand is fed by the capstan to a take-up apparatus at a relatively low tension so long as at least a particular minimum force is applied by the take-up apparatus for winding to the particular strand. When this minimum force is no longer applied to the strand the capstan ceases to feed the strand. The capstan is continuously driven at a constant speed. Preferably, a skewed idler roll is provided in association with the capstan for maintaining the strand wraps about the capstan and roll separate and distinct from each other. The tension at which the strands are fed to the winder may be varied by means of adjustable bails for varying the length of contact of the strands with the capstan. One of these bails is provided to obtain substantially equal tension of the strands fed to the take-up apparatus upon start-up of the apparatus, and another of the bails provides for a desired tension of the strands fed to the take-up apparatus during subsequent taking up of the strands. When winding of

any strand stops, for example, when a wound package is full and the strand is cut, or the strand breaks between the capstan and the take-up apparatus the minimum force required for feeding of the strand to the take-up apparatus terminates so that feeding of the strand is automatically stopped while the capstan continues to be rotated.

3,831,874

YARN DRIVE ROLLER

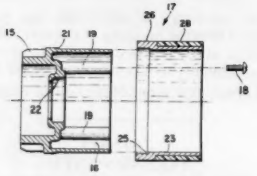
Keith Lenton Andrew, 2419 Cliff Rd., Mississauga, Ontario; John Anthony Charnock, 8 Langmiur Crescent, Toronto, Ontario, and John Prescott Browne, 21 Regan Crescent, Georgetown, Ontario, all of Canada

Filed July 5, 1972, Ser. No. 269,177

Claims priority, application Canada, Sept. 22, 1971, 123410

Int. Cl. B65h *51/00*

U.S. Cl. 242—47.01 8 Claims



A yarn drive roller having a two-part co-planar drive surface, one part being metallic or of other wear resistant material and the other being a frictional drive surface of synthetic material, rubber, or other composition.

3,831,875

THREAD STORAGE AND SUPPLY DEVICE FOR TEXTILE MACHINES

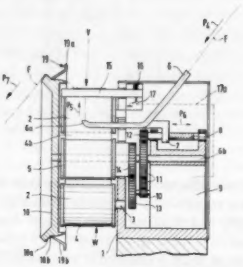
Kurt Arne Gunnar Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Vistaholm, Ulricehamn, Sweden

Filed June 11, 1973, Ser. No. 368,668

Claims priority, application Germany, June 16, 1972, 2229529

Int. Cl. B65h *51/20*

U.S. Cl. 242—47.13 22 Claims



A thread storage and supply device for a textile machine including a winding body upon which a thread can be wound in a circumferential direction to form two or more layers of stored thread windings, and from which the threads can be removed, such as in the axial direction thereof. A storage surface is associated with the winding body and is movable relative thereto in the circumferential direction thereof. A thread guide device is provided for conducting the thread to the storage surface, which guide device is disposed inside the space defined by the layers of stored thread windings such that the issued thread penetrates between the storage surface and the innermost layer of thread windings.

3,831,876

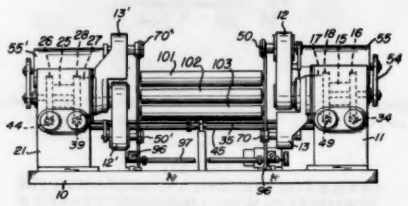
CONTINUOUS UNWINDING APPARATUS FOR WEB MATERIAL

Richard W. Phelps, and Richard S. Tetro, both of Fulton, N.Y., assignors to The Black Clawson Company, Middletown, Ohio

Filed Dec. 11, 1972, Ser. No. 314,142

Int. Cl. B65h *19/14*

U.S. Cl. 242—58.3 9 Claims



Continuous unwinding apparatus for web material comprises a pair of opposed end stands, each of which carries a pair of roll-carrying arms mounted for independent rotation on a common axis, and a splicer assembly is mounted for adjusting movement with respect to the end stands to accommodate rolls of definite diameters. There is no center shaft between the end stands, but separate drives couple opposed pairs of arms and provide for driving each coupled pair in either direction in any desired speed. An outstanding characteristic of the apparatus is that the movements of each pair of arms between splicing and final unwinding positions are confined to two quadrants of rotation.

3,831,877

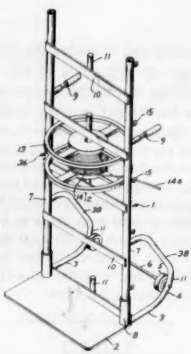
WIRE PULLING APPARATUS

Joseph J. Bennett, 6440 W. 163rd Pl., Tinley Park, Ill. 60477, and Alvin A. Trapp, 9717 S. Melina, Oaklawn, Ill. 60453

Filed May 30, 1972, Ser. No. 258,187

Int. Cl. B65h *75/40*, *49/00*

U.S. Cl. 242—86.5 R 7 Claims

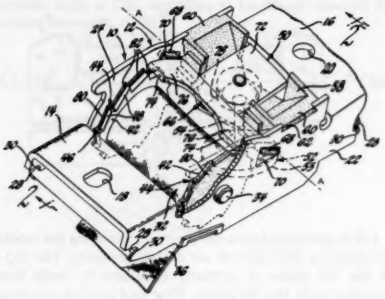


A portable wire cart for transporting a plurality of wire coils and dispensing wire from the coils, which includes a plurality of horizontally positioned, detachable, rotatable, circular base members, to support the wire coils, independently mounted on the cart's frame structure. Detachably positioned over each base member is a circular guide member to hold the wire coils in place. The wire cart is adapted for use in a vertical position, and wire may be independently added or drawn from any of a plurality of coils which may be placed on the cart.

3,831,878
RESTRAINT BELT RETRACTOR

Henry W. Griffin, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 21, 1973, Ser. No. 362,494
Int. Cl. A62b *35/02*; **B65h** *63/04*
U.S. Cl. 242—107.4 **3 Claims**

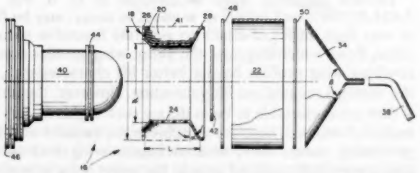


A vehicle occupant restraint belt retractor including a metallic locking member gravity biased to an unlocked position out of engagement with annular ratchet configurations on metallic end plates of the retractor belt reel to allow unwinding belt rotation of the reel. An inertia member responsive to abrupt horizontal vehicle acceleration or deceleration moves the locking member to a locked position in engagement with radial locking surfaces of the ratchet configurations so as to prevent belt unwinding rotation of the reel. Plastic disks carried by the reel alongside the end plates include cushioning portions which prevent metal-to-metal engagement between the locking member and connecting surfaces of the ratchet configurations that extend generally circumferentially of the reel between the inner and outer ends of adjacent locking surfaces. The plastic cushioning portions thus mitigate rattling noise of the retractor when vertical acceleration pulses move the locking member to locked position, such as during use of the retractor on a vehicle negotiating a bumpy road.

3,831,879
WIRE DISPENSER

John E. Miller; Eugene L. Shaver, both of Baltimore, and Jack C. Stone, Eldersburg, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 11, 1970, Ser. No. 18,428
Int. Cl. B65h *49/00*
U.S. Cl. 242—129 **7 Claims**

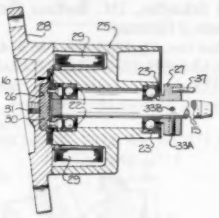


An outside payout wire dispenser including a specially configured spool; wire coiled on the spool under tension; and an insulative coating which binds the outside layer of wire on the spool. The spool may be specially configured with predetermined ratios of hub diameter to flange diameter, hub diameter to flange diameter to length of spool, predetermined flange angle, and predetermined pitch angle of the wire wound on the spool. Further, the invention may include a pool cover which has a necked down wire exit portion with a predetermined angle.

3,831,880
STRAND MATERIAL CREEL AND TENSION CONTROL

Eugene F. White, and Francis H. White, both of S. Church St., Monroe, N.C. 28110

Filed May 7, 1973, Ser. No. 357,841
Int. Cl. B65h *59/04*
U.S. Cl. 242—156 **10 Claims**

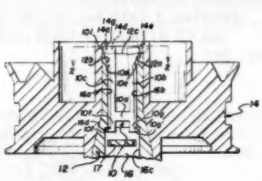


Strand material is dispensed from wound packages under controlled tension conditions by imposing a restraint against rotation of the wound packages as strand material is withdrawn therefrom. The restraint is imposed by controlled coalescence of a body of magnetic particle material subjected to a controllable magnetic flux, with coalesce of the material imposing between a housing and a radially extending rotor forces which resist rotation of the wound package.

3,831,881
DISENGAGEABLE ANTI-BACKUP DEVICE FOR FILM CARTRIDGE

Archie J. Tucker, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 229,924, Feb. 28, 1972, abandoned. This application Jan. 12, 1973, Ser. No. 323,019
Int. Cl. G03b *1/04*; **G11b** *15/32, 23/04*
U.S. Cl. 242—194 **8 Claims**



An anti-backup device located within a film cartridge insertable into a camera permits the rotation of a film take-up core in a forward direction while securing the core against rotation in a reverse direction so as to prevent "clockspringing" of film when the cartridge is not within a motion picture camera. The anti-backup device comprises a fork-like member located within a hollow core on a rotatable film take-up core. The control member has flexible outwardly extending arms projecting from a body portion. In an engaged position of the control member, the arms thereof slide over internal cam or ratchet surfaces of the take-up core during rotation of the core in the forward (take-up) direction and hence permits such rotation. On the other hand, these arms engage the cam or ratchet surfaces of the core post to block rotation of the core when an attempt is made to rotate the core in the

reverse (unwinding) direction. When the film cartridge is placed within a camera, the member can be moved axially until it is out of engagement with the cam or ratchet surfaces, thereby permitting free rotation of the core in both the forward and reverse direction. This eliminates the "clicking" noise associated with operation of the anti-backup device and also permits filming of fade-and-lap dissolve sequences in cameras having mechanisms for filming such sequences.

3,831,882

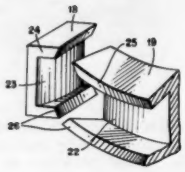
GUIDE MEANS FOR MAGNETIC TAPES WOUND ON FLANGELESS SPOOLS

Horst Fitterer, 3 Buehlerstrasse, 6900 Heidelberg-Hasenleiser, and Norbert Schaeffer, 21C Berliner Strasse, 6700 Ludwigshafen, both of Germany

Filed Dec. 12, 1972, Ser. No. 314,357

Int. Cl. G03b *1/04*; **G11b** *15/32, 23/04*

U.S. Cl. 242—199 **6 Claims**



A guide element for magnetic tapes to be wound in the form of packs on flangeless spools, particularly for tapes in magnetic tape cartridges, which is arranged in a fixed position near the periphery of the pack at maximum pack diameter and provided with a guide surface and guide flanges. Such elements improve guidance of the turn of tape approaching and/or leaving the pack, resulting in a stable and accurate winding on the spool and in undisturbed tape travel.

3,831,883

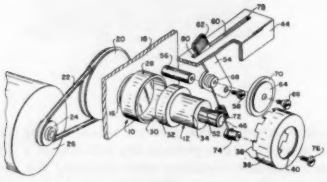
REEL DRIVING DEVICE FOR A WEB TRANSPORTING APPARATUS

Donald O. Easterly, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 3, 1972, Ser. No. 294,709

Int. Cl. B11b *15/32*; **G03b** *1/04*

U.S. Cl. 242—207 **9 Claims**



A web transporting apparatus employs a reel driving spindle incorporating a friction clutch that is influenced by the radial load applied to the spindle. During normal operation of the apparatus, the winding torque that the spindle imparts to the reel is determined by the weight of the reel and the web wound thereon. During a rapid winding mode of operation, an additional radial load is applied to the spindle by a freely rotatable pressure roller or the equivalent to increase the torque transmitted to the reel through the spindle.

3,831,884

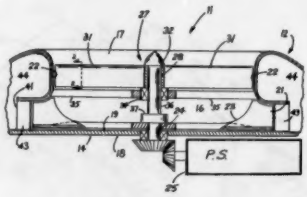
METHODS AND DEVICE FOR GENERATING LIFT

Winfrid O. E. Schellin, 1154 Little Lehigh Dr., South, Emmaus, Pa. 18049

Filed Feb. 27, 1973, Ser. No. 336,279

Int. Cl. B64c *29/02*

U.S. Cl. 244—12 C **7 Claims**



Lift is generated on a lift plane by exposing the underside of the plane to atmospheric air and its pressure. The top surface of the lift plane is partially enclosed by walls forming a chamber with the lift plane. First and second openings in the walls of the chamber permit a flow of air therethrough. Provision is made to establish a flow of air through the chamber. As air enters the chamber, energy is transferred from the air to a turbine to reduce the pressure of the air entering the chamber, thereby reducing the air pressure exerted against the top surface of the lift plane. The difference between pressures against the underside and the top surface of the lift plane amounts to a net lift force on the plane. The energy transferred to the turbine is applied to an impeller to aid in removing air from the chamber, and to aid in maintaining the air flow through the chamber.

3,831,885

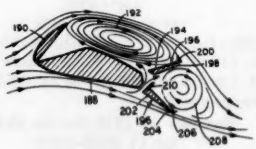
AIRCRAFT WING WITH VORTEX GENERATION

Witold A. Kasper, 1853 132nd Ave. S.E., Bellevue, Wash. 98005

Filed July 11, 1972, Ser. No. 270,652

Int. Cl. B64c *9/28, 23/06*

U.S. Cl. 244—40 A **4 Claims**



Tail-less airplanes, such as disclosed in U. S. Pat. No. 3,438,597 as a stall occurs or is about to occur, may be flown at very high angles of attack to generate favorable spanwise vorte, flows which augment the swept wing profiles creating resultant wing profiles having better lift characteristics, i.e., the vortexes created are lift generating. However, the aircraft is then uncomfortable to be in during such flights at very high angles of attack. Therefore to achieve the benefits of this lift generating vortex flow, without maneuvering such aircraft into a very high angle of attack, the swept wing is equipped with airfoil structures and accessories therefor, which are extended beyond the cruising speed contour of the swept wing, at lower speeds, to create spanwise vortex air flows which selectably enlarge the effective overall airfoil contours as sensed by the passing major air flows. Sustaining aerodynamic lift forces are thereby created at angles of attack well beyond the stall angles of the cruising airfoil contour, and by timely use of such airfoil structures, the vortex air flows are created

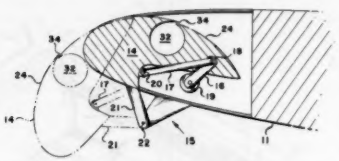
soon enough for lift generating, so stable flight conditions may be created without so extensively altering the pitch of the landing and/or slow flying tailless aircraft.

3,831,886

AIRFOIL WITH EXTENDIBLE AND RETRACTABLE LEADING EDGE

Kenneth P. Burdges, Atlanta, and Arthur J. Robertson, Sr., Marietta, both of Ga., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Jan. 26, 1973, Ser. No. 327,113
Int. Cl. B64c *9/24, 21/04*
U.S. Cl. 244—42 CC **7 Claims**



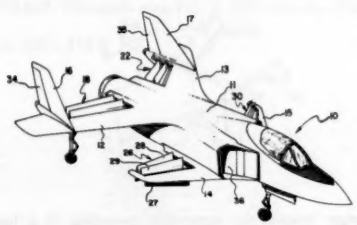
A leading edge device (referred to as a foreflap) is formed by passing a curved parting line through an airfoil in such a manner as to allow the front part of the airfoil to rotate about a pivot which is close to the wing external contour. When the foreflap is thus extended, the resulting airfoil contour has a large bulbous nose which is formed mainly by the parting line. The exact contour of the resulting nose may be shaped to optimum aerodynamic contour for high lift operation without adversely affecting high speed performance, since the parting surface is inside of the clean airfoil when the foreflap is retracted. The foreflap may be operated by any conventional means, e.g., a simple hinge located at the pivot outside of the airfoil contour.

3,831,887

AIRCRAFT CONTROL METHODS

John P. Fosness, Upper Arlington, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed June 28, 1973, Ser. No. 374,429
Int. Cl. B64c *9/38*
U.S. Cl. 244—42 CC **7 Claims**



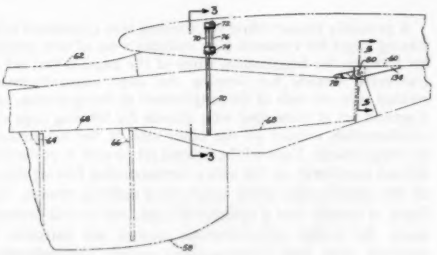
Method of apparatus operation are disclosed for advantageously developing fluid-reaction lift control and also attitude control in improved manners in aircraft systems of the type capable of vertical, hovering, transitional, and conventional modes of flight operation. The apparatus consists of an aircraft system having an airframe with right and left primary airfoils and right and left canard airfoils, spaced-apart forward and after rotatable flap members in each airfoil which define a lift ejector diffuser section having a divergence angle, an engine operable at different rotational speeds to produce different corresponding high-energy primary fluid flows and a duct system for selectively distributing the total primary fluid flow from the engine to the lift ejector diffuser sections in each airfoil. The method of operating the control system comprises the steps of: operating the engine at a constant rotational speed and output power to produce a total primary fluid flow; distributing the total primary fluid flow to the lift ejector diffuser sections in proportions divided equally between said right and left airfoils; and changing the altitude or attitude of the aircraft by rotating the forward and after flap members in opposite directions with respect to each other in each of the airfoils to change the lift ejector divergence angles while the rotational speed, output power and total primary fluid flow of the engine and the proportional distribution of the total primary fluid flow remains constant.

3,831,888

AIRCRAFT ENGINE SUSPENSION SYSTEM

Sherman F. Baker, and Frederick D. Hess, Jr., both of Long Beach, Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed July 27, 1972, Ser. No. 275,805
Int. Cl. B64d *27/18*
U.S. Cl. 244—54 **5 Claims**



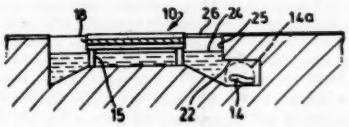
A three-point monoball suspension system for attaching engine pylons to aircraft supporting structure. Two of the three points are located forward of the wing front spar. The lower forward point is close to the wing lower plating and the upper forward point is close to the wing upper plating. The aft point is located as far aft as possible to be contained in the pylon and attaches to the wing lower plating and internal wing support structure.

3,831,889

AIRPORT RUNWAY CONSTRUCTION

John H. Deacon, 23 Barduas Ct., Kanata, Ontario, Canada

Filed June 21, 1973, Ser. No. 372,186
Int. Cl. B64f *1/100*
U.S. Cl. 244—114 **9 Claims**



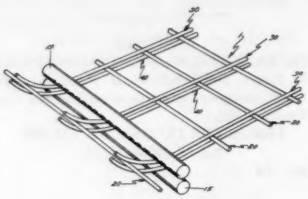
An airport runway has a grid structure for supporting aircraft during take-off and landing. The grid structure extends over a liquid reservoir and comprises bars defining therebetween spacings extending downwardly through the grid structure and in open communication with the reservoir, which has means, e.g. expansible chambers, for raising the

level of liquid in the reservoir through and above the grid structure to remove snow and ice from the latter. Barriers around, and above the level of, the grid structure confine the liquid.

3,831,890
METHOD AND FABRIC FOR FORMING PIPE REINFORCEMENT

Wilbur E. Tolliver, Holland, Mich., assignor to New York Wire Mills Corp., Tonawanda, N.Y.

Filed Feb. 8, 1973, Ser. No. 330,607
Int. Cl. B21f *27/00*
U.S. Cl. 245—2 **12 Claims**

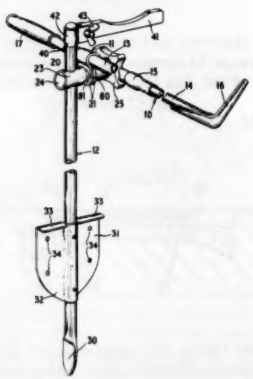


A generally planar fabric for forming into cylindrical reinforcing cages for concrete pipe includes a set of wire strands for forming the longitudinal wires of the cage, a first set of transverse strands for forming the cage circumferentials welded onto one side of the longitudinal defining strands, and a second set of transverse wire strands for forming cage circumferentials welded on the other side of the longitudinal defining strands. Each of the second set strands is preferably but not necessarily, in line with a corresponding first set strand on the opposite side of the longitudinal defining strands. This fabric is formed into a cylindrical cage, and in one embodiment, the inside circumferential strands are narrower in diameter than their corresponding outside circumferential strands.

3,831,891
ROD SUPPORTS

William Frederick Jester, Solihull, England, assignor to Incol Presswork Limited, Rickenhill, Solihull, Warwickshire, England

Filed Mar. 7, 1972, Ser. No. 232,572
Int. Cl. A01k *97/10*
U.S. Cl. 248—44 **7 Claims**

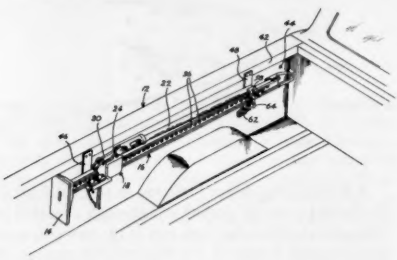


A fisherman's rod support has a hermetically-sealed telescopic boom connected to a post by an adjustable mounting. The post has a profiled plate cross member towards its pointed lower end to facilitate secure erection. The adjustable mounting includes a mounting shaft adjustably secured to the post by a first clamp member and the boom is carried by a second clamp member journalled on said shaft. Both clamp members are controlled by a common actuating member.

3,831,892
JACK LOCK

David M. Herman, P.O. Box 161, Bonanza, Bonanza, Oreg. 97623

Filed Sept. 4, 1973, Ser. No. 393,911
Int. Cl. A47b *96/06*
U.S. Cl. 248—201 **5 Claims**

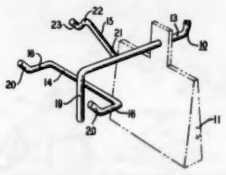


A very popular jack is made by a single manufacturer, but sold under three different names, to-wit, "Hi-Lift," "Handyman" and "Lumberman." The present invention provides theft-obstructing means for securely and stably mounting and locking a jack of this type to the inner face of a side wall of a pickup tray, or to any other wall structure.

3,831,893
RETENTIVE HANGER BRACKET

Richard L. Zentar, Middletown Twp., Monmouth County, N.J., assignor to T-R Wire Co., Belford, N.J.

Filed Jan. 16, 1973, Ser. No. 324,220
Int. Cl. A47g *23/02*
U.S. Cl. 248—223 **3 Claims**



A hanger bracket for removable mounting on a hanger board having a hanger arm for supporting display items and a yoke and brace for engaging holes in the hanger board.

3,831,894
OVERHEAD LIGHT SUSPENSION HANGER

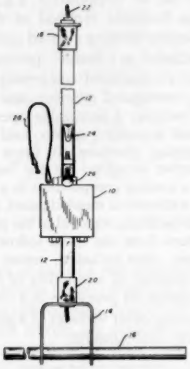
William D. Newton, II, 1103 E. 60th, Apt. 132, and Darrell L. Smith, 2633 E. 38 St., both of Tulsa, Okla. 74105

Filed Feb. 20, 1973, Ser. No. 334,123
Int. Cl. F16l *3/12*; **F21o** *21/34*
U.S. Cl. 248—327 **4 Claims**

This abstract describes a vertically adjustable appliance support device, such as those which are used in television studios for the support of lighting fixtures, etc. The device com-

prises a housing which can be removably clamped to a support pipe hanging from the ceiling of the studio. There is a vertically adjustable elongated member or arm which passes through aligned openings in the top and bottom walls of the housing. The lower end of the arm includes fastening means to which appliances of various sorts such as lighting fixtures can be attached.

Inside the housing is a locking means which comprises a hinged plate supported on the bottom surface of the housing,



and urged downwardly by means of a helical spring pressing between the locking means and the top surface of the housing. The locking means presses against the vertically adjustable elongated member or arm and prevents its downward movement. To release the locking member the arm is pushed to the side so that the angle between the locking member and the arm is now less than a value which is required to provide the locking feature. At this smaller angle the arm is capable of sliding down or up and therefore can be quickly adjusted to any desired position.

3,831,895

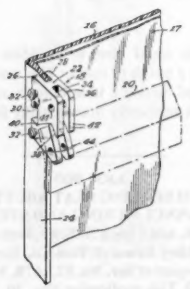
HANGING DEVICE FOR DISPLAY ELEMENTS ON CHANGEABLE COPYBOARDS

Wilfried Schubert, Bensenville, Ill., assignor to National Advertising Company, Bedford Park, Ill.

Division of Ser. No. 220,868, Jan. 26, 1972, Pat. No. 3,738,040. This application Feb. 1, 1973, Ser. No. 328,729

Int. Cl. A47g *1/16*

U.S. Cl. 248—475 R **4 Claims**



A hanging device for mounting changeable display elements such as letters, characters, and other indicia, particularly pictorial display panels onto changeable copy-boards including an adjustable portion adjustably attachable to the pictorial panel and a mounting slot opposite the adjustable portion for engaging a hanger bar on the copy-board background, the position of the hanging device being adjustable on the pictorial panel for adjustably aligning the panel on the copyboard background, and fastening members at the adjustable portion for securely attaching the hanging device to the panel. A reversible hanging device in which there are provided on each respective opposite sides thereof both an adjustable portion and a hanger bar mounting slot, so that when in use the adjustable portion and the complementary mounting slot on opposite sides are in use, the hanging device being reversible so that if desired the other adjustable portion and its complementary mounting slot on the opposite side of the hanging device can be used in order that the panel can be hung on any one of several different types of hanger bar copyboard backgrounds corresponding respectively to one of the two mounting slots.

3,831,896

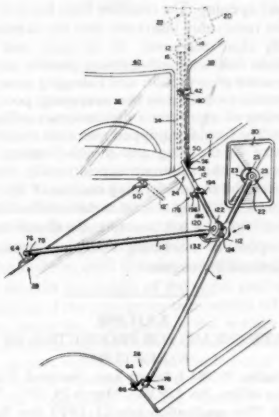
AUXILIARY REAR VIEW MIRROR SYSTEM

Clarence C. Owens, 616 S. Vann Ave., Evansville, Ind. 47714

Filed Oct. 30, 1972, Ser. No. 302,135

Int. Cl. B60r *1/06*

U.S. Cl. 248—479 **31 Claims**



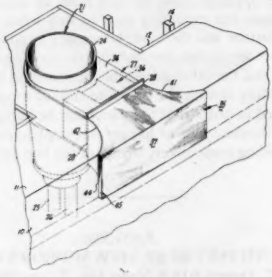
For use on a vehicle, an auxiliary rear view mirror system comprising first, second and third elongated, rod-like support arms, each arm having a proximal end portion and a distal end portion. The distal end portions of the arms are connected together, and a mirror is connected to the distal end portion of at least one of the arms. The proximal end portion of the first arm is connected to the vehicle at a first point adjacent the base of the corner post between the windshield and the front side window. The proximal end portion of the second arm is connected to the vehicle at a second point spaced forwardly of and below the said first point while the proximal end portion of the third arm is connected to the vehicle at a third point spaced forwardly of the first point and above the said second point. In the self-storing embodiment of the invention, the connections of the second and third arms to the vehicle are releasable connections while the connection of the first arm is a permanent jointed connection such that the arms can be folded to extend together along the post in a storage position. In the nonself-storing embodiment, the connections between each of the three arms and the vehicle are manually releasable connections such that the arms can be removed together as an assembly.

3,831,897

SKIMMER THROAT ENTRANCE FORM

William J. Stegmeier, 1021 Shary Cir., Concord, Calif. 94518

Filed Feb. 26, 1973, Ser. No. 335,953
Int. Cl. E02d 17/00
U.S. Cl. 249—1 10 Claims



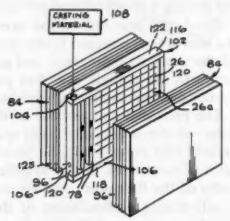
A reusable skimmer throat entrance form to provide an inlet opening in an upwardly extending wall of a swimming pool to enable surface water from a filled pool to enter a surface skimmer through the throat thereof which communicates with the inlet opening. The reusable form has at its inner end a plug section removably insertable into the skimmer throat to substantially close the same. At its outer end portion the reusable form has a mouth-forming section extending outwardly from the plug section and enlarging transversely with respect thereto to define in the swimming pool wall an entrance opening of appropriate dimensions, configuration, and orientation. The form is equipped with stop structure adjacent the mergence of the plug and mouth-forming sections for cooperation with the skimmer to positionally relate the form and skimmer. The mouth-forming section of the form is provided with a sheath along at least certain wall surfaces to resist abrasion and impact of wet concrete, the sheath being resilient for the purpose of elastically receiving impact from wet concrete directed thereagainst.

3,831,898

PNEUMATIC MEANS FOR PRODUCTION OF MOLDED STRUCTURES

Carrol C. Sachs, 9938 Clybourn Ave., Sunland, Calif. 91352

Division of Ser. No. 129,039, March 29, 1971, Pat. No. 3,768,769. This application July 11, 1973, Ser. No. 378,337
Int. Cl. B28b 7/32
U.S. Cl. 249—65 5 Claims



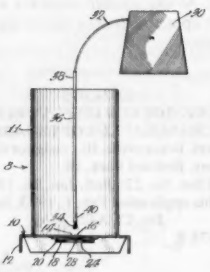
Pneumatic means comprising a hollow mandrel or hollow tube having secured around its outer surface along the length thereof according to one embodiment, a flexible open-cell polyurethane foam sleeve and an outer skin formed of a flexible non-permeable plastic such as a vinyl plastic skin adhesively secured to the outer surface of the flexible open-cell foam sleeve, and air passages for communication between the interior of the mandrel and the open-cell foam sleeve, the resulting assembly being positioned in a mold for production of cored structural panels. In operation the tool assembly is placed under pressure and expanded to force the plastic skin of the assembly outwardly during pouring and setting of the construction material, e.g., a cement or cement-polymer composition in a mold, and after setting thereof the tool assembly is subjected to reduced pressure or a vacuum to withdraw the plastic skin from the set composition, e.g., in the form of a molded panel, to facilitate removal of the tool from the molded panel, thereby forming a cored construction material or panel. Also included as a feature, pneumatic means in the form of a bellows arrangement comprising an external flexible, e.g., rubber, corrugated member, and in the interior of such corrugated member a permeable open-cell, e.g., polyurethane, foam, and tensioning means, said bellows being inflatable for applying pressure to force a contact, e.g., honeycomb, member mounted on the bellows, against an outer surface of a casting composition in a mold, to form an outer surface for a structural molded panel, and which bellows can be deflated to facilitate removal of the pneumatic tool and associated members from the mold following setting of the panel construction. Also included, means providing a combination or arrangement of a plurality of both said mandrel and bellows assemblies for provision of a cored molded structural panel containing outer surfaces of a predetermined, e.g., smooth or textured, configuration.

3,831,899

CANDLE MOLD WITH RESILIENT WICK HOLDER

Stuart H. Doig, 1304 Deerpass Rd., Marengo, Ill. 60152

Filed June 5, 1972, Ser. No. 259,377
Int. Cl. C11c 5/02
U.S. Cl. 249—97 5 Claims



A novel candle mold base to facilitate securing a wick therein including a patch of rubber-like material held against the base plate and having a hole therein adapted to contain one end of a wick resiliently in essentially fluid-tight relationship.

3,831,900

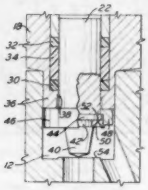
VALVE WITH SEALING SEAT ABUTTING A SOFT ANNULAR RING AND STEM

Stephen Matousek, and Ulrich H. Koch, both of Moraga, Calif., assignors to Whitey Research Tool Co., Emeryville, Calif.

Continuation-in-part of Ser. No. 822,678, May 7, 1969, Pat. No. 3,623,699. This application Nov. 30, 1971, Ser. No. 203,320The portion of the term of this patent subsequent to Nov. 30, 1988, has been disclaimed.
Int. Cl. F16k 47/00
U.S. Cl. 251—122 15 Claims

The combination of a valve body with a flow passage therethrough and a stem which projects through an aperture

into said passage for sealing against an annular seat therein. An annular recess in the inner end of the stem shaft holds a seal ring under radial compression. A flange intermediate the ends of the stem shaft engages an oppositely directed flange on a telescopingly mounted ferrule, a cylindrical portion of the ferrule projects downwardly over the stem flange and is crimped about the periphery of the annular ring to initiate said compression. A nose portion on the stem shaft projects



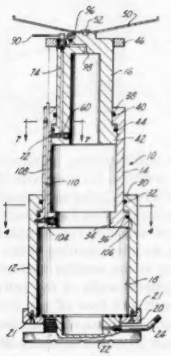
through the center of the ring and together the shaft flange, nose portion and ferrule portion combine to define said annular recess which is substantially completely filled by the ring. The shaft, ring and ferrule are concentrically mounted and reciprocate as a unit within the valve body between a closed position where the exposed face of the seal ring engages the annular seat and an open position where the seat and ring are spaced apart.

3,831,901

VEHICLE JACK WITH LOCKING MEANS

Donald M. Williams, 3283 Spruce, Inkster, and Charles S. Seidel, Royal Oak, both of Mich., assignors to Donald M. Williams, Inkster, Mich.

Filed Oct. 19, 1972, Ser. No. 298,880
Int. Cl. B66f *3/24*
U.S. Cl. 254—93 R **5 Claims**



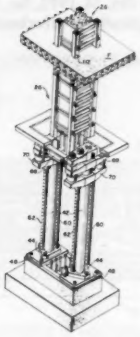
A fluid pressure operated vehicle jack comprising telescoping members adapted to be extended upon connection with a container of pressurized air. Automatically actuated safety means are provided which lock the members in the extended position.

3,831,902

METHOD OF ERECTING A MULTI-STORY BUILDING AND APPARATUS THEREFOR

Peter M. Vanderklaauw, Miami, Fla., assignor to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 114,455, Feb. 11, 1971, Pat. No. 3,692,446. This application Aug. 9, 1972, Ser. No. 279,053
Int. Cl. B66f *1/00*
U.S. Cl. 254—105 **14 Claims**



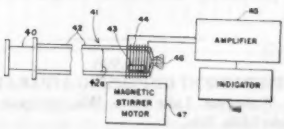
A multi-story building with concrete floor slabs and supporting columns is formed in a roof down fashion and erected in a progressive lifting process from the foundation. Auxiliary columns in the form of sectional steel casings hold fresh concrete to form the columns, support the building while the concrete columns harden and provide means for attachment to lifting devices that are supported on bearing platforms at the foundation. The load of the permanent concrete structure is transferred to the auxiliary columns through interlocking surfaces between the casings and the concrete columns. The auxiliary columns are pushed up by the lifting devices, that act in a climbing fashion, until the concrete therein hardens to a strength to support the weight of the upper part of the building. The sections of the casings are then peeled off and rotated to positions below for reuse so that the bottom part of the building is always supported by the auxiliary columns acting as an interim support structure. When the building has reached the planned height, the lowermost concrete columns are cast solid with the foundation and the auxiliary equipment is removed for reuse in other buildings.

3,831,903

ATMOSPHERICALLY ISOLATED MIXING APPARATUS WITH VISCOSITY RESPONSIVE INDICATOR

Richard P. Harmel, Jr., 126 Babcock St., Brookline, Mass. 02146

Filed Aug. 3, 1972, Ser. No. 277,678
Int. Cl. B01f *13/08*
U.S. Cl. 259—1 R **15 Claims**



Disclosed is a mixing apparatus for mixing liquids in a mixing chamber that is isolated from the atmosphere. A water

bath is provided for temperature regulation and a viscosity responsive indicator monitors the condition of the liquids in the chamber.

3,831,904

COMMON PLANE SEQUENTIAL MIXING APPARATUS

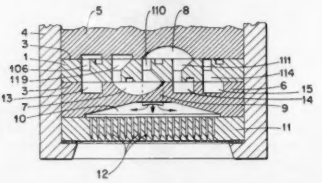
Jacques W. J. Appeldoorn, and Robert Sluijters, both of Arnhem, Netherlands, assignors to Akzona Incorporated, Erka, N.C.

Division of Ser. No. 83,402, Oct. 23, 1970, Pat. No. 3,701,619. This application Oct. 24, 1972, Ser. No. 300,227

Claims priority, application Netherlands, Nov. 14, 1969, 6917131

Int. Cl. D01d *3/00*

U.S. Cl. 259—4 **10 Claims**



An improved mixer with no moving parts is obtained by arranging mixing elements in side-by-side relationship.

3,831,905

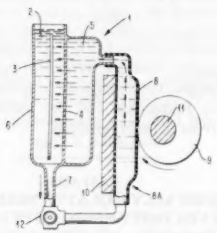
AGITATED REACTOR FOR PROCESSING SEMICONDUCTOR SUBSTRATES

Maung S. Htoo, Poughkeepsie; Claude G. Metreaud, Fishkill, and Herman F. Schmitt, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,597

Int. Cl. B01f *5/06, 5/12, 15/02*

U.S. Cl. 259—4 **1 Claim**



An agitated liquid reactor whose fluid is recirculated from an outlet through a porous wall structure. Recirculation is effected through a conduit having a flexible conduit portion which is periodically compressed toward the porous wall structure.

3,831,906

INGREDIENT DISPERSING APPARATUS

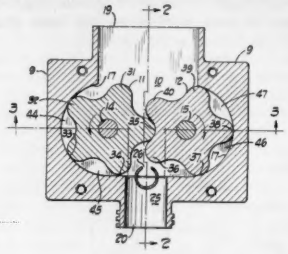
Alden H. Wakeman, Lake Mills, Wis., assignor to Crepaco, Inc., Lake Mills, Wis.

Filed Nov. 9, 1972, Ser. No. 305,154

Int. Cl. B01f *7/02, 3/12*

U.S. Cl. 259—6 **12 Claims**

An ingredient dispersing apparatus is disclosed for dispersing a semi-solid ingredient into a viscous fluid ingredient to produce a homogeneous dispersion. The invention comprises a mixer such as a gear pump to divide the semi-solid ingredient into discrete volumes and provisions for streaming the viscous fluid to remove the semi-solid ingredient from the mixer. The apparatus is easily cleaned and is desirable for use



with food products such as ice cream, yogurt and the like. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications and is not to be construed as a limitation on the scope of the claimed subject matter.

3,831,907

CONTINUOUS FLOW MIXING APPARATUS

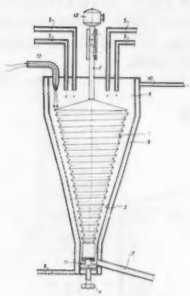
Frans Henri Claes, Edegem, Belgium, assignor to Agfa-Gevaert, Mortsel, Belgium

Filed Mar. 31, 1971, Ser. No. 129,751

Claims priority, application Great Britain, Mar. 4, 1970, 15950/70; Mar. 4, 1970, 15948/70

Int. Cl. B01f *7/08*

U.S. Cl. 259—7 **16 Claims**

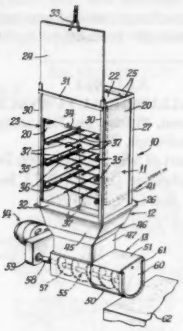


A continuous flow liquid mixing apparatus in which a rotor is arranged coaxially within a housing with the mutually facing peripheral surfaces thereof defining a clearance space in the form of an annular passage with a gradually and continuously decreasing radial cross-section. This annular passage serves as a mixing zone having an inlet opening at the larger section end and an outlet opening at the smaller section end thereof. The mutually facing peripheral walls of the rotor and housing are continuous and smooth and free of any interruptions or perforations and preferably the radial dimension of the clearance space is not more than 10 mm and optimally not more than 5 mm. Drive means are provided for imparting relative rotation to the rotor or housing to apply shearing forces to liquid passing through the mixing zone. In the region upstream of the mixing zone, the mutually facing peripheral wall sections of the rotor and housing diverge sharply to provide a feeding space which is free of interruptions in the form of baffles, grooves or the like and the liquid or liquids to be mixed are introduced into this feeding space.

3,831,908
PUTTY CONDITIONING METHOD AND APPARATUS

Robert A. Burst, 164, Mission Rd., Winona, Miss. 38967

Filed May 2, 1973, Ser. No. 356,636
Int. Cl. B01f 7/02
U.S. Cl. 259—191 7 Claims

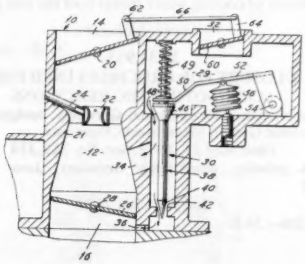


An improved method and exemplary apparatus for plasticizing applique putty materials to a workable state in which normally solidified masses of putty, used in ornamenting picture frame mouldings and the like, are heated on open racks in a live steam chamber. The solidified putty melts in the hot wet atmosphere and gravitationally drips into a hopper communicating with a mixing screw conveyor which agitates and blends the putty into a homogeneous plastic mass for discharge thereby through a gate as needed.

3,831,909
CARBURETOR CHOKE ALTITUDE COMPENSATION

Richard J. Freismuth, Mt. Clemens, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 3, 1972, Ser. No. 303,662
Int. Cl. F02m 1/10
U.S. Cl. 261—39 A 8 Claims

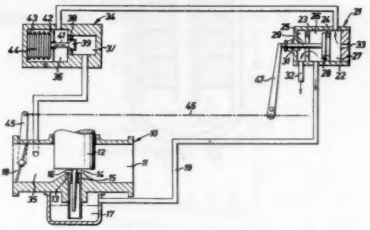


A carburetor has an air passage in a parallel arrangement with the induction passage for supplying supplemental air around the venturi to the air/fuel mixture in response to changes in ambient operating conditions, the air bypass passage being controlled by a first valve sensitive to changes in ambient conditions, the passage including an additional valve connected to the choke valve for restricting additional airflow in proportion to closing of the carburetor choke valve to provide a desired rich starting and running mixture varying with changes in ambient operating conditions.

3,831,910
CARBURETORS

Colin Francis Shadbolt, Linslade, England, assignor to The Zenith Carburetter Company, Limited, Stanmore, Middlesex, England

Filed Dec. 11, 1972, Ser. No. 313,794
Claims priority, application Great Britain, Dec. 16, 1971, 58494/71
Int. Cl. F02m 9/06
U.S. Cl. 261—39 A 5 Claims

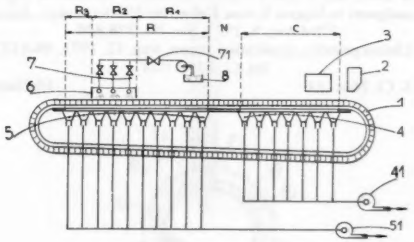


To provide a carburetor in which the fuel/air proportion in the mixture supplied is not materially affected by ambient atmospheric pressure, without introducing problems during engine idling due to the introduction of excessive fuel vapor into the carburetor induction passage, a valve controlled in common with the engine throttle valve which, when the said throttle valve is open connects the fuel chamber to a controlled source of suction, is moved when the throttle valve is closed to connect said fuel chamber to the ambient atmosphere.

3,831,911
APPARATUS FOR THE AGGLOMERATION OF ORE

Robert Dorville, Paris, France, assignor to Delattre-Levivier, Paris, France

Filed June 29, 1973, Ser. No. 374,997
Claims priority, application France, July 26, 1972, 72.26829
Int. Cl. F27b 9/14
U.S. Cl. 266—21 9 Claims

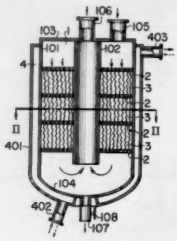


A plant for the agglomerate of ore, comprising a movable chain passing through an ore cooling zone includes means located in the cooling zone for spraying onto the upper surface of the hot ore a cooling fluid which can be entrained by air passing through the layer ore. The spray cooling part of the cooling zone may be located between two air cooling parts. The cooling fluid may be water.

3,831,912
APPARATUS FOR REFINING SODIUM

Shigehiro Shimoyashiki, Hitachi; Kiyoshi Makita, Iwaki, and Naoshi Aoki, Hitachi, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Sept. 27, 1972, Ser. No. 292,531
Claims priority, application Japan, Sept. 28, 1971, 46-75677
Int. Cl. C22b *3/02*
U.S. Cl. 266—22 **13 Claims**



Refining or the removal of impurities from sodium traveling within a closed circuit for heat exchange of a fast breeder nuclear reactor or the like is obtained by means of a sodium refining chamber as a part of the circuit having therein netlike members disposed against the sodium flow and a heat exchanger for selectively heating and cooling of the sodium as it flows around the netlike members for the precipitation of the impurities during cooling and for the remelting of the impurities during heating. The thus remelted impurities during heating are discharged through a discharge pipe in the lower portions of the sodium flow adjacent the netlike members. The netlike members are constructed of large mesh, knitted wire material having the wire strands constructed of a plurality of fine wires, with the adjacent layers of net having spaces between their faces. The net layers are preferably corrugated, with the direction of corrugation being inclined with respect to the direction of knitting and further being inclined with respect to the corrugations of an adjacent layer. The travel of the sodium through the netlike members is such that it will be in counter flow heat exchange relationship, with the interposition of a heat conductive flow separator, with the flowing liquid sodium that has just passed through the netlike members.

3,831,913
APPARATUS FOR DIRECT IRON REDUCTION

Ryo Ando, and Kokichi Hagiwara, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1972, Ser. No. 278,820
Claims priority, application Japan, Aug. 12, 1971, 46-61270
Int. Cl. F27b *7/28*
U.S. Cl. 266—24 **15 Claims**

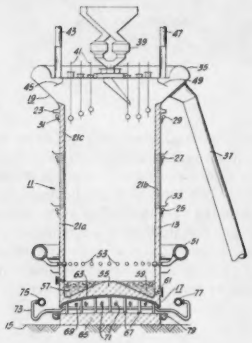
In a direct iron reduction process of the type utilizing a rotary kiln, oxidizing gas is blown into the bed in the rotary kiln so as to increase the temperature of the bed and to increase the speed of movement of the gas in the bed.

The rotary kiln used in this method has a cross-sectional configuration in the form of a ratchet wheel and is provided with a plurality of inlet ports for oxidizing gas at the roots of the teeth of the ratchet wheel. Partially reduced composite pellets containing iron ore and a carbonaceous material are admitted into one end of the rotary kiln which is provided with a fuel burner at the opposite end. The rotary kiln is further provided with a heat exchanger at said one end to heat the oxidizing gas by the exhaust gas from the rotary kiln.

3,831,914
METALLURGICAL FURNACE

Robert E. Zimmermann, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 317,099, Dec. 20, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,575
Int. Cl. C21b *7/10*
U.S. Cl. 266—25 **9 Claims**

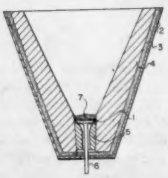


A novel metallurgical furnace with a cylindrical shell and a contoured hearth is disclosed in combination. The cylindrical shell is lined with different refractory materials of uniform thickness, and the contoured hearth comprises a crowned sole plate, such as a dished head, covered with stepped refractory bricks. A plurality of columns engage a foundation cap plate, and a plurality of cooling water sprays cool the sole plate.

3,831,915
CLOSURE FOR CRUCIBLES USED FOR ALUMINOTHERMIC REACTIONS

Hans Guntermann, Essen-Steele, Germany, assignor to Elektro-Thermit GmbH, Essen-Steele, Germany

Filed May 21, 1973, Ser. No. 362,310
Claims priority, application Germany, June 22, 1972, 2230430
Int. Cl. C21c *7/00*
U.S. Cl. 266—34 R **2 Claims**



This invention relates to an improvement in a closure for crucibles used for aluminothermic reactions comprising a tap

pin, a sealing material, and refractory sand, the improvement comprising a sealing material of inorganic fibers covering the tap pin.

3,831,916

STEEL CONVERTER

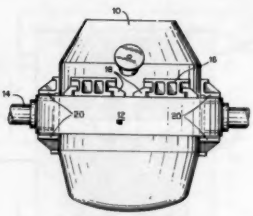
Natan Frydman, Paris, France, assignor to Fives Lille-Cail, Paris, France

Filed Oct. 3, 1972, Ser. No. 294,666

Claims priority, application France, Oct. 11, 1971, 71.36438

Int. Cl. C21c 5/50

U.S. Cl. 266—36 P 5 Claims



A steel converter vessel, when in the vertical position, is supported on the trunnion ring solely by four seats fixed to the vessel wall and disposed on respective sides of a diametrical vertical plane containing the trunnion axes and symmetrically in respect of a vertical plane perpendicular thereto. Shoulder clamps are fixed to the trunnion ring and arranged to maintain the seats on the ring. Stop means fixed respectively to the vessel and the trunnion ring take up solely forces parallel to the plane of the trunnion ring, the stop means being disposed adjacent the trunnions.

3,831,917

TILTABLE CONVERTER

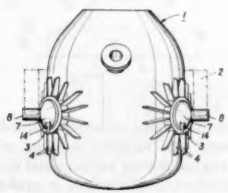
Peter Moser, Linz-Dornach, Austria, assignor to Vereinigte Osterreichische Eisenund Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Mar. 8, 1973, Ser. No. 339,302

Claims priority, application Austria, Mar. 15, 1972, 2170/72

Int. Cl. C21c 5/50

U.S. Cl. 266—36 P 5 Claims



The invention relates to a tiltable converter with a carrying ring surrounding at least part of the converter jacket and supporting the converter by carrying means which take up the bearing and tilting forces, said carrying means consisting of annular bearing lugs into which the carrying bodies extend. The annular bearing lugs and the carrying bodies are connected by means of flange connections arranged at a distance from the converter jacket, so that between the flange connections and the converter jacket a hollow space is formed. Thus, the screw connection is easily accessible for tightening the screws, the carrying bodies are not overheated and the thermal expansibility is not disturbed.

3,831,918

HEAT INSULATING DURABLE TUYERE

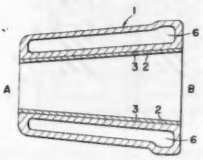
Keisuke Mori; Takehiro Yamada, both of Kisarazu; Katsumi Nakamoto, Kimitsu; Hirosi Onaka; Takeshi Yamamoto, both of Tokyo, and Taizo Kato, Yokohama, all of Japan, assignors to Nippon Steel Corporation and Asahi Glass Company Limited, both of Tokyo, Japan, part interest to each

Filed June 13, 1973, Ser. No. 369,595

Claims priority, application Japan, June 13, 1972, 47-58119

Int. Cl. C21b 7/16

U.S. Cl. 266—41 4 Claims



A low expansion ceramic lining is formed on the inner surface of the combustion gas inlet of a tuyere. The low expansion ceramic lining is made of a material which has a thermal expansion coefficient less than 0.5 percent. The low expansion ceramic lining is preferably formed on the inner surface of the tuyere by cementing a low expansion ceramic tube onto the tuyere with a cement consisting of a low expansion ceramic cement or a castable refractory material.

3,831,919

TELESCOPIC GAS SPRINGS

Lawrence George Nicholls, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed June 5, 1972, Ser. No. 259,578

Claims priority, application Great Britain, June 9, 1971, 19658/71

Int. Cl. F16f 9/24

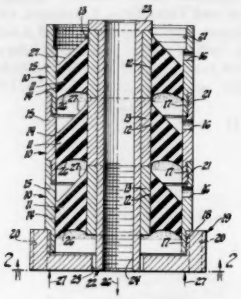
U.S. Cl. 267—34 2 Claims

A telescopic gas spring comprises a cylinder closed at one end, a piston slidable in the cylinder and a piston rod carrying the piston and extending sealingly through the other end of the cylinder. An auxiliary spring is disposed at the closed end of the cylinder and comes into operation as the piston approaches a position of full compression, to provide additional resistance to further compression of the gas spring. The auxiliary spring may be a coil spring or a gas spring.

3,831,920
NOISE PREVENTING SHOCK ABSORBER

Charles R. Meldrum, Detroit, and Glyn A. Bindon, Oxford, both of Mich., assignors to Ace Controls, Inc., Farmington, Mich.

Filed Jan. 12, 1973, Ser. No. 323,060
Int. Cl. F16f 7/12
U.S. Cl. 267—137 **7 Claims**

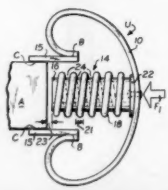


A noise preventing shock absorber adapted for silently absorbing the sound due to noise sources, as when moving machine parts engage mating surfaces and decelerate to zero velocity within a short travel distance or stroke. The shock absorber member includes a unitary resilient member which is dish-shaped in vertical cross section and provided with an axial bore therethrough, with the peripheral surface of the axial bore forming an inner force-transmitting surface. An upper force-receiving means is bonded to the inner force-transmitting surface. The resilient member is provided with a peripheral outer force-transmitting surface concentric with and axially offset downwardly from the inner force-transmitting surface. The resilient member is also provided with an axially inward extended recess on the lower side thereof around the axial bore and within the outer force-transmitting surface. A lower force-receiving means as, for example, an outer tube is bonded to the outer force-transmitting surface. The shock absorber may be used in a stacked arrangement to provide a unit of increased shock absorbing and noise preventing capacity.

3,831,921
COLLISION GUARD DEVICE

Cesar T. Negado, 25-12 169th St., Flushing, N.Y. 11358

Filed Apr. 13, 1973, Ser. No. 350,941
Int. Cl. B60r 19/08
U.S. Cl. 267—139 **6 Claims**

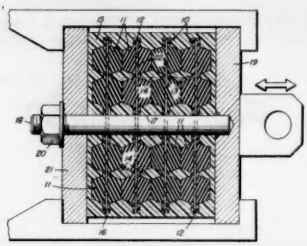


A collision guard unit, adapted for attachment to a surface to be protected, which comprises an impact loop having opposite ends which are affixed to the surface to be protected. Interposed between the inner side of the loop and the protected surface is an energy absorption assembly. A plurality of collision guard units may be connected to a pair of transverse members to enlarge the surface area that can be protected. The transverse members also serve to dissipate the impulsive force of a collision throughout the total system, thereby enhancing its overall efficiency.

3,831,922
SHOCK ABSORBER

Bernard Simon Appleton, Hewlett, N.Y., assignor to Unilan A.G., Chur, Switzerland

Filed Oct. 6, 1972, Ser. No. 295,539
Int. Cl. F16f 7/12
U.S. Cl. 267—140 **9 Claims**

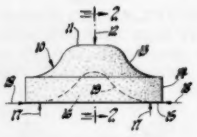


A cushioning device particularly well suited for use in a draft gear of a railway vehicle comprises a plurality of rigid plates disposed one over the other and having symmetrically disposed non-porous elastomeric protuberances on each face thereof with interstices between the protuberances being filled with an elastomeric plastic foam which binds the elements together into a unitary structure.

3,831,923
NOISE PREVENTING SHOCK ABSORBER

Charles R. Meldrum, Detroit, Mich., assignor to Ace Controls, Inc., Farmington, Mich.

Filed Jan. 12, 1973, Ser. No. 323,061
Int. Cl. F16f 7/12
U.S. Cl. 267—141 **37 Claims**



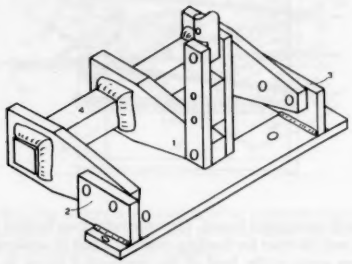
A noise preventing shock absorber adapted for silently absorbing the sound due to noise sources, as when moving machine parts engage mating surfaces and decelerate to zero velocity within a short travel distance or stroke. The shock absorber includes a unitary resilient member having an annular force-receiving surface on the lower end thereof and a force-receiving surface on the upper end thereof which is disposed radially within and axially spaced apart from the lower force-receiving surface, and said resilient member being inverted dish-shaped in vertical cross section and provided with an axially inward extended recess on the lower side thereof within the annular lower force-receiving surface. The shock absorber member can be used in a stacked arrangement, with or without an outer casing, to provide a unit of increased shock absorbing and noise preventing capacity.

3,831,924

TORISONAL ENERGY ABSORBER

Robert Ivan Skinner, 31 Blue Mountain Rd., Silverstream, Lower Hutt, New Zealand

Filed Dec. 26, 1972, Ser. No. 318,279
Claims priority, application New Zealand, Dec. 23, 1971, 165913
Int. Cl. F16f 1/16
U.S. Cl. 267—154 8 Claims



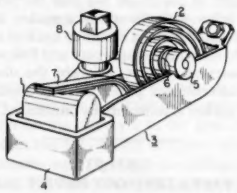
A device is disclosed which absorbs from a structure such as a building energy imparted by an earthquake or a high wind and so inhibits damage to the building. Two members of the structure which move in opposite directions during vibration are coupled by levers to a bar of annealed low carbon steel in such a way that the bar is strained in torsion during vibration. A bar having a square cross-section with a side five inches long strained up to 4 percent in torsion has a capacity of approximately 70,000 N for several hundred cycles. The failure of such an absorber at the end of its useful life is not catastrophic.

3,831,925

SPIRAL SPRING UNITS FOR PRESSING BRUSHES

Toshio Nakamura, and Sadaharu Kawai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 4, 1972, Ser. No. 294,804
Claims priority, application Japan, Oct. 6, 1971, 46-77927
Int. Cl. F16f 1/12
U.S. Cl. 267—156 4 Claims



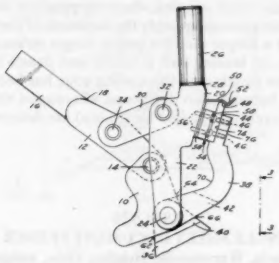
A spiral spring unit for pressing brushes, which consists of a plurality of spiral spring elements bonded together at the opposite ends thereof and which is capable of pressing the brush always with a constant pressure.

3,831,926

UNIVERSAL CLAMP WITH PIVOTING ARM RETENTION MEANS

Jack J. Sendoykas, St. Clair Shores, and Alexander W. McPherson, Farmington, both of Mich., assignors to Dover Corporation (De-Sta-Co. Division), Detroit, Mich.

Filed Aug. 28, 1972, Ser. No. 284,038
Int. Cl. B25b 5/12
U.S. Cl. 269—228 8 Claims



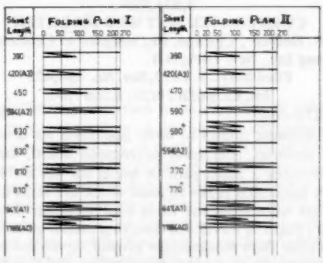
A manually operated toggle type clamp suitable for clamping a work piece to a machine bed or the like and having retention means suitable for stopping and holding the clamp in a pre-determined open position. The retention means is mounted on an arm initially pivotally attached to the base of the clamp with complementary engaging means attached to the handle link. When the clamp is set up, the retention means is adjustably positioned as desired and welded to the base. At the same time, the clamp support plates are adjusted and welded to the base in the appropriate position to determine the fully closed position. The clamp is then ready for repeated operation from the adjusted fully closed to the final pre-determined open position with assurance that the clamp is rigidly mounted upon the base with the required closed work clamping position, and the desired opening stroke ending with a hold open retention.

3,831,927

METHOD AND APPARATUS FOR FOLDING SHEETS SUCH AS DRAWINGS

Jozef Marie Van Herten, Venlo, Netherlands, assignor to Oce-Van der Grinten N.V., Venlo, Netherlands

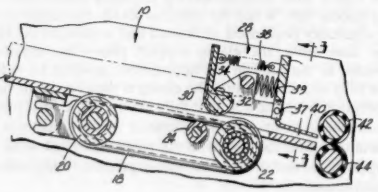
Continuation-in-part of Ser. No. 137,549, April 26, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 348,883
Claims priority, application Netherlands, Apr. 10, 1972, 7204777
Int. Cl. B45h 45/20
U.S. Cl. 270—79 20 Claims



Large sheets such as drawings having any of various lengths are folded into packets of standard length in the direction

transverse to the folds by feeding the sheets individually past length measuring points spaced apart along a pathway to a zig-zag folder which is actuated at intervals determined by a computing control system in response to signals received from sheet detectors located at the measuring points. The detectors sense simultaneously a certain location of the leading edge of each sheet and the presence or absense of the sheet at other points in the pathway, thus determining the folding pattern to be applied to the sheet; and as the sheet is advanced the control system measures the residual length, if any exists, by which the sheet trails a point where its presence was sensed and determines correspondingly the locations of certain folds. When a sheet is longer than the length ranges defined between the detectors, its leading part is folded into panels having the desired packet length until the trailing edge has been brought into a range between two detectors, whereupon the residual length and corresponding fold location(s) are determined.

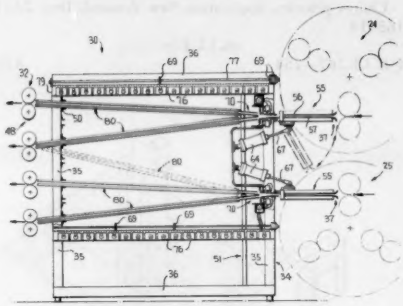
3,831,928
SINGLE SHEET DOCUMENT FEEDER
James W. Davis, Warrensville Heights, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio
Filed Mar. 28, 1973, Ser. No. 345,510
Int. Cl. B65h *3/54*
U.S. Cl. 271—35 **3 Claims**



An apparatus for feeding articles from the bottom of a stack of such articles. The relative coefficients of friction of the articles, an endless belt drive and an article limiter are used to restrict movement to one article at a time. The article limiter begins to pivot when the endless belt drive moves. The pivoting produces an additional force perpendicular to the stack of articles to assist in transporting documents toward the article limiter. Separation of the articles in the stack also occurs to varying degrees as a result of the article limiter pivoting.

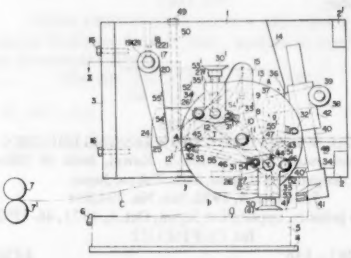
3,831,929
CORRUGATED SLIT WEB DIVERTER
Ernest W. Hellmer, Chicago, Ill., assignor to Continental Can Company Inc., New York, N.Y.
Filed May 31, 1972, Ser. No. 258,425
Int. Cl. B65h *29/58;* **B26d** *7/06*
U.S. Cl. 271—64 **19 Claims**

This disclosure relates to novel apparatus for diverting slit webs of material, preferably corrugated board, and in one aspect includes a main path of travel for slit webs along a generally horizontal plane beyond which are flaps for diverting the slit webs from the main path to either of a pair of secondary paths of travel, the diverting means including a pair of deflectable flaps mounted for pivotal movement between a first position in diverging relationship in a downstream direction and either of second and third parallel positions each of which is in alignment with a pair of spaced elongated guide elements, and first and second means operable to move respective one or another of the flaps to achieve the respective second and third positions thereof. A portion of the main path and/or an elongated guide element of each secondary path is removable from its normal position to assist in removing



jammed corrugated board. The apparatus may further include a full web diverter for feeding either of a pair of tandem slitter-scorers prior to the feed of the corrugated board to the slit web diverter.

3,831,930
PAPER FEEDING APPARATUS FOR USE IN PRINTING MACHINE
Shigeru Shimizu, Osaka, Japan, assignor to Hamada Printing Press Co. Mfg. Co., Ltd., Osaka-shi, Japan
Filed Mar. 19, 1973, Ser. No. 342,409
Claims priority, application Japan, Apr. 14, 1972, 47-37527
Int. Cl. B65h *3/08*
U.S. Cl. 271—91 **9 Claims**

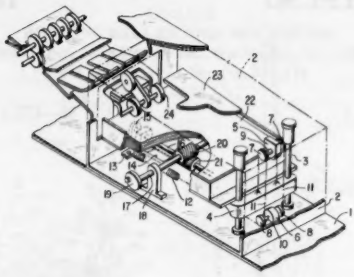


A paper feeding apparatus for use in a printing machine in which the sheets of paper are fed into the printing machine one after the other with the use of a sucker device which is continuously rotated along a modified cycloid curve by means of a cam mechanism including a cam and follower in cooperation with air-suction systems, whereby the disadvantages inherent in a conventional paper feeding apparatus having a reciprocating sucker is substantially eliminated.

3,831,931
SHEET PAPER FEED OUT DEVICE IN COPIER
Takuzo Tsukamoto, Yamato, Japan, assignor to Fuji Xerox Co. Ltd., Tokyo, Japan
Filed June 2, 1972, Ser. No. 259,015
Int. Cl. B65h *1/04, 1/12*
U.S. Cl. 271—126 **5 Claims**

Sheet papers are piled up on a lifter which is spring biased upward and the uppermost paper is in pressed contact with a set of feed out rollers. The feed out rollers are rotatably pro-

vided at a fixed position and the papers are pressed thereon from underneath. The force by which the papers are pressed



on the feed out rollers is controlled to be constant regardless of the number of sheets of papers by controlling the force of the spring for biasing the lifter upward.

3,831,932

TAKE-OFF MECHANISM FOR SHEET DELIVERY APPARATUS USED WITH A PRINTING PRESS

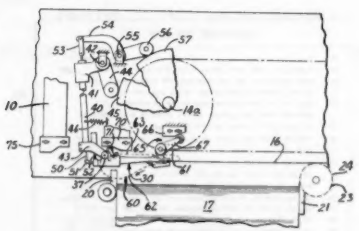
Karl Conrad, Dietzenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Offenbach/Main, Germany

Filed July 20, 1972, Ser. No. 273,620

Claims priority, application Germany, July 23, 1971, 2136810

Int. Cl. B65h *29/10*

U.S. Cl. 271—182 **9 Claims**



A take-off mechanism for delivering a series of sheets from a conveyor onto a delivery pile. Positive transfer of the sheets from the grippers on the conveyor to the jaws of the take-off mechanism is effected by moving the jaws along a take-off path which coincides with the conveyor delivery path and at the same speed as the sheet and by engaging the jaws prior to the time the grippers are released. Stationary cams are used to close and open the jaws adjustable for both the timing and amount of opening. The transport mechanism for the take-off jaws includes cams synchronized with the conveyor for imparting separate horizontal and vertical components of movement to the jaws so that the jaws move in a predetermined closed loop path having transfer, deceleration and return portions.

3,831,933

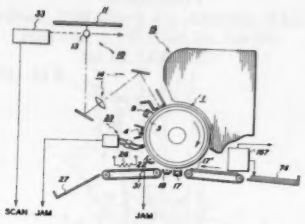
TAMPER DETECTION AND RECOVERY

Louis J. Fantozzi, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 6, 1973, Ser. No. 348,829

Int. Cl. B65h *7/04*

U.S. Cl. 271—258 **9 Claims**



Tamper detection apparatus in a machine to which articles are fed in succession at a regular time interval, includes means for detecting the condition where the article supply is running out and generating an out of supply signal, and means for determining from the nature of the out of supply signal whether the out of supply condition occured actually or was induced artifically. The apparatus may be used in a copier/duplicator machine to determine whether the out of paper supply condition detected during a copy run is due to an actual condition or a falsely induced one.

3,831,934

SECTIONAL CREATIVE TOY

John P. Hancovsky, Shaler Township, Pa., assignor to Hi-Ho Products, Inc., Sharpsburg, Pa.

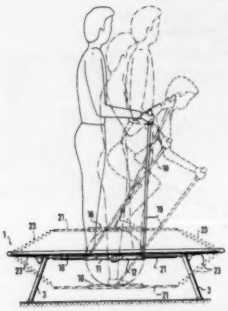
Division of Ser. No. 144,583, May 18, 1971, Pat. No. 3,780,469. This application Aug. 29, 1973, Ser. No. 392,560

Int. Cl. A63g *29/00, 11/00*

U.S. Cl. 272—56 **7 Claims**

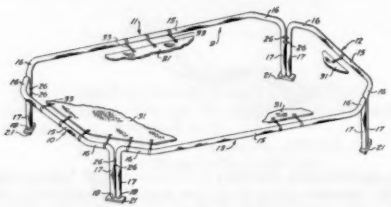
The specification discloses a creative toy of light-weight, durable material, such as a low-density polyethylene and plastic composition, which is made up of a plurality of interlocking arcuate sections capable of assembly in a variety of different ways to provide different life-size toys for juveniles, such as a hoop, slide or chair. Each section of the toy comprises a body portion of hollow, thinwalled and substantially rectangular cross-section having a protruding V-shaped tongue at one end and at the opposite end a recess of complementary and interlocking configuration to the tongue. The outer and inner walls of the body portion are curved inwardly and the side walls have shallow cups recessively molded therein for decoration and reinforcement purposes.

3,831,935
MOVABLE PLATFORM EXERCISER
Hubert Hofle, Sandrartstrasse 2, Munich, Germany
Filed Sept. 22, 1972, Ser. No. 291,242
Claims priority, application Germany, July 23, 1971, 7136204
Int. Cl. A63b 69/18
U.S. Cl. 272—57 B 6 Claims



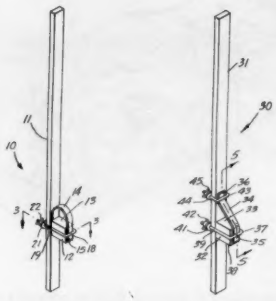
An exercising device for physical fitness trainings, especially for usage as an at-home exerciser. The exercising device is characterized by two double crank arms attached to a frame and revolving around a horizontal axle. Additionally, the inner arms of the two double crank arms are connected with at least one platform on which a user stands. A handle bar is attached for the user on the outer arm of each double crank arm. When the user stands on the platform and grasps the handle bars, by appropriately shifting his body weight, he can cause the platform to go in a circular motion. This movement is opposed by spring attachments which tend to keep the platform in a horizontal attitude throughout its complete motion. The movements carried out by the user are similar to those of skiing.

3,831,936
TRAMPOLINE FRAME
John Samuel Watson; Richard John Watson, and Robert Gordon Watson, all of 2454 W. 13th Ave., Vancouver, British Columbia, Canada
Filed June 11, 1973, Ser. No. 368,574
Int. Cl. A63b 5/18
U.S. Cl. 272—65 1 Claim



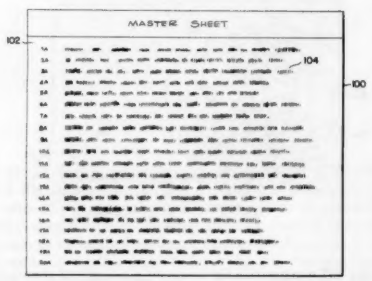
A trampoline frame formed of a plurality of frame members formed of lengths of U-shaped tubular metallic pipe disposed with the bases of each length extending in continuous end to end relationship in the same plane and with legs of each length depending in contiguous parallelism. A U-shaped connector is driven into the lower ends of the legs to connect the latter and means are provided for preventing relative lateral movement of upper ends of the legs so as to prevent separation of frame members under load.

3,831,937
ADJUSTABLE STILT
Massena F. Jones, P.O. Box 616, Vaughan, Miss. 39179
Filed May 30, 1973, Ser. No. 365,147
Int. Cl. A63b 25/00
U.S. Cl. 272—70.1 4 Claims



Stilts for walking at a raised elevation. The stilts include an elongate generally rectangular upright support board having a generally rectangular foot support block vertically adjustably secured thereto by an encompassing U-bolt including a strap connecting the threaded ends of the U-bolts. Wing nuts tighten on the strap to clamp the block to the upright in its vertically adjusted position. A flexible loop is secured to the block by the U-bolt in one form of the invention. In a second form of the invention one end of the flexible strap is secured to the block by the U-bolt and the opposite end of the strap is adjustably connected to the upright by a second generally rectangular U-bolt.

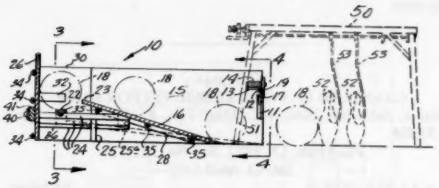
3,831,938
WORD PLUS WORD GAME
Lewis Neubauer, Philadelphia, Pa., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Sept. 28, 1973, Ser. No. 401,825
Int. Cl. A63f 9/00
U.S. Cl. 273—1 R 6 Claims



A word by word game employing the following major components (used as described hereinafter): a master sheet containing twenty messages of twelve words each; forty-eight wood word first pieces, each having a message word on one side and a number identifying the position of this word in the message on the other side; forty eight second pieces divided into four like groups of twelve pieces, each piece in each group carrying a different number from one to twelve inclusive; a plurality of markers each carrying a different one of numbers from one to thirty inclusive; a plurality of chips, each carrying a different one of numbers one through twelve inclu-

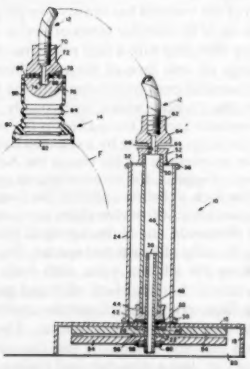
sive thereon; and a plurality of commpoint pieces each having one of the following legends thereon; comm, commu, commun, communi, communic, communica, communicat, communicate and Good Thinking.

3,831,939
BOWLING BALL RETURN MECHANISM
Kenneth Lorber, 5823 Osceola Rd., Washington, D.C. 20016
Filed Jan. 16, 1973, Ser. No. 324,170
Int. Cl. A63d 5/02
U.S. Cl. 273—48 1 Claim



A mechanism for automatically returning a bowling ball to the bowler, in a toy bowling game, is described. The mechanism comprises an inclined apron which the ball travels up after passing through the bowling pin area. If the ball has been bowled with sufficient force, it will pass along the complete extent of the inclined apron and fall off the top of the apron onto a ramp which is inclined downwardly to either side, from its apex which is aligned with the center line of the apron. The ball then passes onto either a right or left hand downwardly inclined ramp from which it rolls back toward the bowler. A one-way gate is provided at the lower end of the apron for permitting the ball to pass onto the apron but preventing the ball from returning into the bowling pin area when the ball has been bowled with insufficient force to carry it to the top of the apron.

3,831,940
DEVICE FOR PLACEMENT OF FOOTBALL
John B. Molettieri, 7047 Paschall Ave., Philadelphia, Pa. 19142
Filed Feb. 22, 1973, Ser. No. 334,629
Int. Cl. A63b 67/00
U.S. Cl. 273—55 B 3 Claims

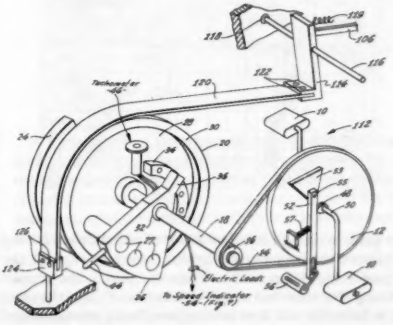


A portable standard is provided with a weighted base. A section of flexible metal tubing extends from the upper end portion of the standard and terminates in a flexible, resilient cupped member made of a rubber material. The tubing may be manipulated so as to turn the open end of the cupped member downwardly for engagement with the upper end of a football thereby held on the ground in position for a place kick.

3,831,941
PROTECTIVE SHOCK ABSORBING DEVICE FOR GOALPOSTS
J. Norman Pease, 2538 Selwyn Ave., Charlotte, N.C. 28209
Filed Mar. 5, 1973, Ser. No. 338,091
Int. Cl. A63b 71/02
U.S. Cl. 273—55 R 6 Claims

This device is particularly adapted for use with goalposts of the type utilized in active sports and serves to protect the players when they collide with the posts. The device includes an inflatable inner tube which is formed with an opening along one side so that it may be easily removed from and placed in position surrounding the goalpost. A protective outer shell surrounds the inflatable inner tube and is provided with an opening along one side having suitable fastening means to secure the shell in position around the inner tube. The amount of air pressure in the inner tube can be varied to thereby vary the cushioning characteristic when a player collides with the shock absorbing device.

3,831,942
PORTABLE EXERCISE MACHINE
Bruce E. Del Mar, Los Angeles, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.
Filed Feb. 13, 1973, Ser. No. 332,149
Int. Cl. A63b 23/04
U.S. Cl. 272—73 6 Claims



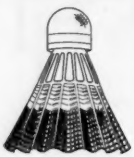
A light weight portable exercise machine is provided for maintaining cardiovascular tone and for rehabilitation of

hospital patients confined to bed. Portability and versatility of the machine are enhanced by a mounting frame which is a part of the unit. Light but sustained exercise is accomplished through pedal operation by the feet and legs of the patient while holding the hands to bars on the frame. A number of permanent magnets are moved into exact juxtaposition opposite other magnets in progressive settings across a modified Faraday disc at a plurality of indented positions, and these magnets, with augmented inertia from a heavy rim, serve to achieve prescription exercise amounts for prescription exercise durations automatically terminated at set limits.

3,831,943
SHUTTLECOCKS

Frank William Popplewell, Saffron Waldren, England, assignor to Dunlop Limited, London, England

Filed Apr. 23, 1973, Ser. No. 353,436
Claims priority, application Great Britain, Apr. 29, 1972, 20021/72
Int. Cl. A63b *67/18*
U.S. Cl. 273—106 A **6 Claims**

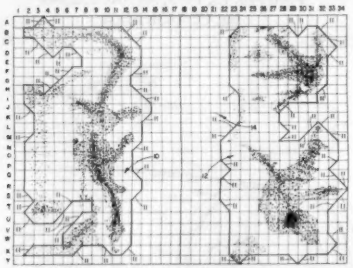


A shuttlecock of moulded plastics material having improved playing qualities has a skirt which includes an imperforate band of plastics material. This band constitutes an intermediate portion lying between perforate upper and lower portions of the skirt, and has a length which is 25–65 percent of the sum of the lengths of the intermediate and lower skirt portions, of which the following is a specification.

3,831,944
BOARD GAME APPARATUS

Kurtis D. Upton, P.O. Box 506, Sacramento, Calif. 93610

Filed Apr. 2, 1973, Ser. No. 347,131
Int. Cl. A63f *3/00*
U.S. Cl. 273—131 BB **6 Claims**

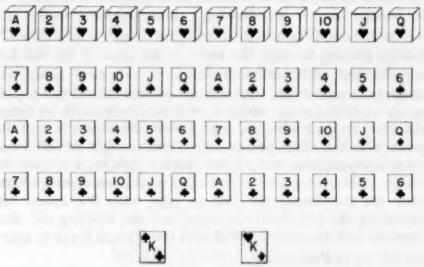


A war game which is played on a pair of boards, each having a grid thereon, the board being divided into three regions, the first region being designated a "friendly island", the second region being characterized as an "enemy island", and the third region, in between said first two regions, being characterized as a "body of water"; the game being played with a plurality of markers having different movement and capture characteristics, said markers being characterized as "tanks", "headquarters", "P. T. Boats", "barges", "carriers", "pill boxes", "destroyer", "battleship", "big gun", "airplane"; each side having three "headquarters" markers, and each of the markers having, in addition to a predetermined moving ability or disability and a destroying ability, a point value; the objective of the game being to destroy all three of the opponent's headquarters markers or to exceed the opponent's score by more than a predetermined number of points; each player having a separate game board which is kept where his opponent cannot see it and upon which all friendly markers are placed and moved, the players taking turns, each getting a predetermined number of marker moves and a predetermined number of "shots" or attempts to destroy opposing markers per turn.

3,831,945
GAME AND PLAYING ELEMENTS FOR SAME

Otto A. Scherini, 2540 N.E. 22nd Ter., Ft. Lauderdale, Fla. 33305

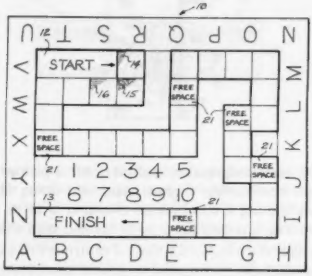
Filed Feb. 13, 1973, Ser. No. 331,736
Int. Cl. A63f *1/00*
U.S. Cl. 273—148 R **9 Claims**



One form of the game consists of small playing pieces with markings on opposite faces representing the usual playing card markings of diamonds, clubs, hearts and spades. A game assembly contains two duplicate game sets to provide a separate set for each of two opposing players or teams. One of the sets may be provided with varients in color, hue or shape to avoid intermixing, but are otherwise identical in indicia arrangement. Each of the two sets has twenty-five playing pieces or "chips," made up of two similar series of twelve chips each plus an odd twenty-fifth chip with a dual role. One of the series has heart markings on one face of the chip, from the Ace representing the numeral one, continuing with the two, three, etc. on through the Queen, which numerically represents twelve. On the opposite face of these chips is the marking for spades with the markings differing by a selected fixed numerical amount as, for example, six. This places the Ace of hearts opposite the seven of spades, the three of hearts opposite the nine of spades, the Jack of hearts opposite the five of spades. etc. The companion series of twelve chips carry on opposite faces the suits of diamonds, and clubs, arranged like the series of chips carrying the suits of hearts and spades. The odd piece represents the King for all four suits, with both heart and diamond indicia on one face and both club and space indicia on the opposing face, giving the player the option of using either one of the two suits showing face up. The pieces or chips are of such size and preferably flat that they can be mixed in a shaker cup, like a dice cup, and thrown out onto a flat surface. The objective of the game is to arrange the twenty-five pieces of a set, as randomly thrown, into as many pat poker hands as possible and with the highest scoring combinations. A solution of five pat hands is termed a "pentago," a

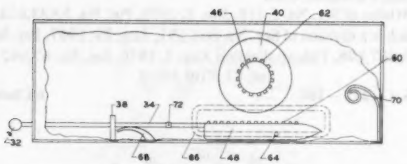
coined word stemming from the Greek prefix "Pente," a combining form meaning five. The game itself with these pieces may be termed PENTAGO. A simplified form of the game utilizes four different colors in lieu of card suits and reduces the number of chips per set to twenty.

3,831,946
EDUCATIONAL BOARD GAME APPARATUS
Donna Denalsky, 3 Winthrop St., Tariffville, Conn. 06081
Filed Feb. 28, 1973, Ser. No. 336,796
Int. Cl. A63f 3/00
U.S. Cl. 273—134 AD **3 Claims**



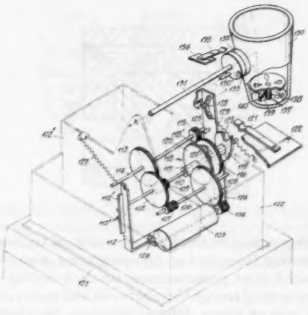
Colored squares on a dice throw "move ahead" board determine the choice of color distinguished piles of problem cards from which a problem card is selected for solution. The card shows the problem or question and contains a hidden answer.

3,831,947
GEAR DRIVEN CYLINDRICAL DRUM CHANCE DEVICE
Louis M. Bittner, 1144 W. River Dr., Margate, Fla. 33063
Filed Aug. 23, 1972, Ser. No. 282,966
Int. Cl. A63f 5/04
U.S. Cl. 273—143 R **2 Claims**



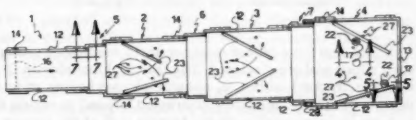
A mechanical game for simulating playing the game of golf. The device includes a box with a face-plate having a plurality of apertures, each aperture representative of a different golf hole having a different value of par, a rotatable indicia covered cylinder beneath the face-plate for displaying within each aperture a different possible golf score, and a slidable bar coupled adjacent the apertures that is moveable to allow the viewing of said cylinder display through only one aperture. The bar position is determined by the players as to which type hole they are playing at the time, whether it be a par three, par four or par five hole. Cylinder display is randomly moved adjacent the aperture in the face-plate by a spring-actuated rack gear which is moved into and out of engagement with a pinion gear coupled to the cylinder by an elliptically shaped cam track.

3,831,948
AUTOMATIC DICE SHAKING DEVICE
Kataro Suda, Tokyo, Japan, assignor to Yoshi, Ito, Tokyo, Japan
Filed Apr. 19, 1973, Ser. No. 352,636
Claims priority, application Japan, Apr. 24, 1972, 47-48381
Int. Cl. A63f 9/04
U.S. Cl. 273—145 R **8 Claims**



An automatic dice shaking and dispensing device comprises a dice cup fixed to a rotary shaft. A switch in the bottom of the cup is activated by the weight of dice dropped into the cup. The switch activates an electric motor which through gear mechanism drives a crank mechanism and timer at two different speeds. The fast driven crank mechanism agitates the dice cup by repeated camming the dice cup on its rotary shaft against restoring spring tension while the slow turning timer has a cam fixed thereto which eventually cams the dice cup far enough to dispense the dice. Finally, the timer and its cam releases the dice cup which is restored to its upright position by the spring tension and the timer deactivates the electric motor.

3,831,949
VARIABLE CONTOUR MINIATURE GOLF DEVICE
Georges Henning, 2192 Auclair St., Laval, Quebec, Canada
Filed Jan. 9, 1973, Ser. No. 322,105
Int. Cl. A63b 67/02
U.S. Cl. 273—176 H **10 Claims**



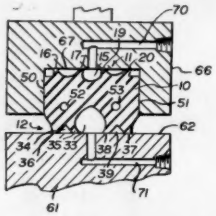
A foldable unit adapted to play mini-golf by putting thereon and arranged to play a multi-hole game therewith by arranging the same into the desired number of different configurations. A varialble mini-golf unit including a plurality of floor sections interconnected by a plurality of connecting ramp sections, the sections being pivoted end to end and having lateral side walls to form a continuous floor path, legs pivoted to each floor section to selectively elevate the latter relative to other floor sections, angularly adjustable deflection bars pivoted onto floor sections onto the floor path to vary the difficulty of putting a ball into a hole, and the sections being of progressively increasing width to be folded one within the lateral confines of the side walls of another to form a compact package.

3,831,950

GASKET FOR CLOSURE SEAL

Richard Lee Bentley, and John Wesley Stubert, both of Memphis, Tenn., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Nov. 10, 1971, Ser. No. 197,232
Int. Cl. F16j 15/00
U.S. Cl. 277—75 2 Claims



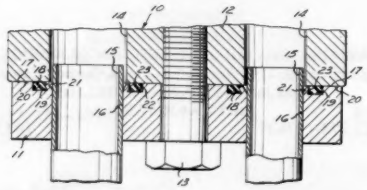
A sealing gasket in the form of a strip of resilient material having sealing faces on two opposing sides, a pair of longitudinal spaced apart protuberances on each sealing face defining a longitudinal trough therebetween and each protuberance having a pair of ridges defining a groove therebetween, said groove being shallower than the trough on the same sealing face.

3,831,951

FACE TYPE O-RING SEAL GROOVE AND METHOD OF PRODUCING SAME

Hiralal V. Patel, Cleveland, and Arthur E. Liggett, Bedford, both of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

Filed Apr. 26, 1972, Ser. No. 247,724
Int. Cl. F16j 15/10
U.S. Cl. 277—170 3 Claims



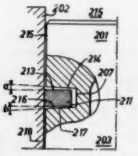
A face seal for a planar member and a method of providing such a face seal are disclosed. The face seal includes an O-ring which is trapped within an annular groove having at least a portion of at least one sidewall stressed beyond its elastic limit to form an acute angle with the bottom wall of the groove and to thereby form a trap to retain the O-ring. The sidewall may be stressed by cutting into the face of the planar member concentrically around and/or concentrically within the groove and simultaneously forcing one or both sidewalls into the groove to form the acute angle. Alternately, only portions of a sidewall may be forced into the groove by deforming localized areas of the planar member adjacent a sidewall. As a further alternative, the sidewall may be stressed by providing a second annular groove in the member surrounding and/or surrounded by the first groove to form an annular wall and then deforming the annular wall into the first groove to form the acute angle. If the O-ring groove closely surrounds a port in the planar member so that a relatively thin wall is defined by the groove and port, the thin wall may be forced into the groove to form the acute angle by a flaring tool inserted in the port to thereby form a trap for the O-ring.

3,831,952

PISTON AND PISTON RINGS UNIT FOR AN INTERNAL COMBUSTION ENGINE

Robert Geffroy, Neuilly-sur-Seine, France, assignor to Sealfire, Luxembourg, Luxembourg, Luxembourg

Division of Ser. No. 705,083, Feb. 13, 1968, Pat. No. 3,759,148. This application May 6, 1971, Ser. No. 141,023
Claims priority, application France, Feb. 17, 1967, 67.95532; June 29, 1968, 68.112517; Jan. 18, 1968, 68.136565
Int. Cl. F16j 9/00; F01b 31/10
U.S. Cl. 277—171 8 Claims



A piston and compression and oil control piston rings unit for internal combustion engines, said unit being placed in a cylinder delimiting a combustion chamber with its head and said piston which comprises a body formed with a head and a skirt, grooves receiving said rings, oil return orifices and a central cavity, each piston ring and its groove comprising a pair of upper contiguous faces and a pair of lower contiguous faces one of said faces of each piston ring being a face assuming the main work of the piston ring, in which:

an efficient sealing means is placed between the face of each piston ring assuming the main work of the piston ring and the contiguous face of its groove, on at least a circle adjoining the inner limit of the face of the piston ring,

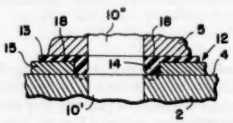
and an access means is placed on at least one important part of the area between the upper contiguous faces of each piston ring and its groove, for the pressure existing above the piston ring.

3,831,953

SOLENOID OPERATED VALVE ASSEMBLY

Kurt W. Leibfritz, Norridge, and Lester W. Malinowski, Des Plaines, both of Ill., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

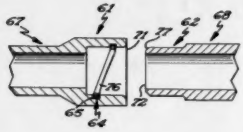
Division of Ser. No. 5,410, Jan. 5, 1970, Pat. No. 3,633,624, which is a division of Ser. No. 664,191, Aug. 29, 1967, Pat. No. 3,487,848. This application Aug. 3, 1970, Ser. No. 67,662
Int. Cl. F16l 19/02
U.S. Cl. 277—180 6 Claims



A sealing unit adapted to be clamped between parallel faces of mating valve parts, comprising a sheet-like resilient gasket member engaged with one of said faces, and a uniform thickness plate member engaged with the other of said faces, said gasket member having apertures bounded on one side only by lateral rib means which extend through aperatures in said plate member beyond the thickness thereof so that said gasket member is squeezed at the rib means between said parallel faces. The sealing unit herein is further characterized

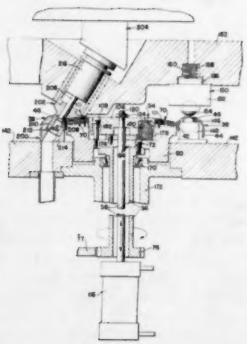
in that said gasket member has lateral projections extending through other apertures in said plate member into cavities in the mating valve part engaged by said plate member thus to locate said sealing unit between said mating parts.

3,831,954
GASKET JOINT CONNECTIONS
Richard C. Longfellow, Long Lake, Minn., assignor to The Cretex Companies, Inc., Elk River, Minn.
Filed Nov. 24, 1972, Ser. No. 309,430
Int. Cl. F16j 15/04
U.S. Cl. 277—207 **17 Claims**



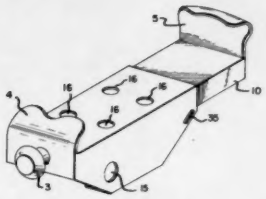
Accouterments for an improved gasket joint connection particularly useful in piping and the like. To obtain a water tight seal when joining or capping lengths of pipe, rubber or elastomeric gasket materials are utilized in a gasket which is imposed between the joining surfaces. In the improved joint connection the gasket groove and associated gasket are maintained in a fixed relationship relative to the compressing edge of the engaging pipe so that radial compression of the gasket takes place at varying rates around the circumference of the gasket instead of compressing all portions of the gasket at the same time. To accomplish this either the gasket or the compressing edge of the engaging member may be constructed or positioned as curvilinear surfaces, nonparallel multiple planes, or a nonparallel plane which is tilted away from the perpendicular to the longitudinal axis of the joint.

3,831,955
CHUCKING DEVICE
Thomas J. Plotzke, Richmond, Mich., assignor to Johnson Die & Engineering Co., Detroit, Mich.
Filed Nov. 22, 1972, Ser. No. 308,706
Int. Cl. B23b 31/40
U.S. Cl. 279—2 A **37 Claims**



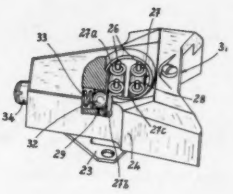
A pin-type chucking device particularly adapted for use with sheet metal parts, to grip and rotatably drive such parts about an axis is disclosed. The invention is embodied in both external and internal pin chuck constructions.

3,831,956
SELF ADJUSTABLE SKI BINDING
Arthur W. Earl, 451 Essex Ave., Bloomfield, N.J. 07003
Filed July 17, 1972, Ser. No. 272,115
Int. Cl. A63c 9/08
U.S. Cl. 280—11.35 D **9 Claims**



The disclosure relates to a self-adjustable ski binding, the binding having a relatively small mounting area on the ski in order to provide maximum flexibility to the ski and decrease the weight sharing capacity of the ski tip and tail.

3,831,957
SAFETY TOE-END DEVICE FOR SKI BINDING
Rene Ramillon, 3 rue Emile Zola, Grenoble, France
Filed Feb. 16, 1973, Ser. No. 333,297
Claims priority, application France, Mar. 1, 1972, 72.07773; May 16, 1972, 72.17967
Int. Cl. A63c 9/08
U.S. Cl. 280—11.35 T **6 Claims**

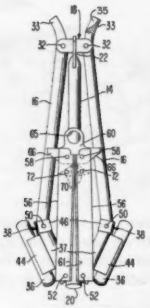


A safety toe-end abutment device for ski binding, of the type comprising an abutment body pivotally mounted on a shaft extending at right angles to the main ski surface and carried by a support secured to the ski, this abutment body comprises in combination a resilient thrust member acting in a plane parallel to the ski main surface and at least two rollers or like members rotatably mounted on shafts perpendicular to said main ski surface, two of these rollers being engaged by said thrust member carried by said support or by said abutment body, said rollers being carried by said abutment body or said support, respectively.

3,831,958
COLLAPSIBLE CART
Morgan G. Keaton, 507 Potrero Ave., San Francisco, Calif. 94110
Filed Jan. 2, 1973, Ser. No. 320,239
Int. Cl. B62b 1/00
U.S. Cl. 280—36 C **13 Claims**

An improved two-wheeled cart capable of supporting and moving a bag, box or other similar article. The cart has a collapsible frame formed of a pair of lower, angled members pivotally connected at their normally upper ends to the normally lower end of a third member so that the members provide an inverted Y-shaped configuration for the frame when

the latter is in an operative condition. Means is provided to releasably hold the frame in such operative condition. A pair of wheels are carried at the normally lower ends of the lower members by a pair of brackets, to each of which is pivotally connected an article-supporting rail. The rails extend inwardly toward each other and their inner ends are interconnected by



pivot pins so that the rails from a collapsible rail assembly responsive to the collapsing of the frame. The rails are positioned overcenter when they are in their operative locations so as to stabilize the cart and hold the wheels apart. Stop means is provided near the inner ends of the rails to limit their downward path of travel as they move into their operative locations.

3,831,959

TRASH CAN DOLLY

Frank J. Fontana, Stratford, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Nov. 27, 1972, Ser. No. 309,721

Int. Cl. B62b *5/00*

U.S. Cl. 280—79.1 **6 Claims**

The following specification describes a trash can dolly comprising a pair of separable U-shaped arms which are assembled at the site in non-rotatable coplanar relationship by means of spaced integrally formed lips and apertures in the respective arms and nesting offset wall portions adjacent the midportion of each arm. The dolly arms have elongate slots at each end for enabling the arms to be secured in common to a can having appropriately positioned peripheral openings, or the slots are used to secure brackets for nestingly receiving other types of cans. In the latter case, the arms are secured together by means of aligned openings and in the case of a snap-fitted can a retainer is secured in common to the arms for engaging the snap-fitted can. In addition, the arms are provided with appropriate recesses and openings for receiving caster stems and fastening means to avoid interference between the can and the caster stems.

3,831,960

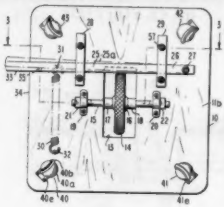
PIVOTABLE SUPPORT FOR A CHAIR FOR SEMI-INVALIDS

Nelson R. Walton, Tamaqua, Pa., assignor to Eugene S. Durigan, Lehighton, Pa., a part interest

Filed Nov. 27, 1972, Ser. No. 309,730

Int. Cl. B62b *5/00*

U.S. Cl. 280—79.1 **5 Claims**



A rotatable support or platform is provided on which a chair may be placed and used by a semi-invalid or other partially incapacitated person and which may be turned or rotated by such person.

3,831,961

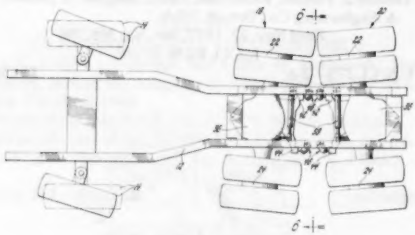
STEERABLE TANDEM AXLE SUSPENSION

Henry A. Peller, Pepper Pike, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 12, 1973, Ser. No. 396,571

Int. Cl. B62d *13/02*

U.S. Cl. 280—81 A **4 Claims**

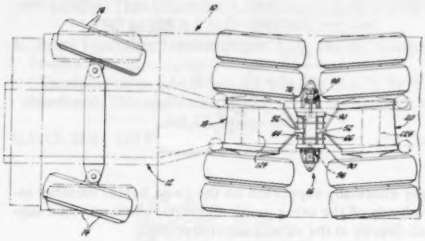


A steerable tandem axle suspension for supporting the rear end of a vehicle frame and including front and rear transversely extending axles each having rotatable wheels at the opposite ends thereof. Each of the axles is formed with a housing having an arm which projects in a direction away from the other axle and a steering cylinder is incorporated with each axle adjacent the other axle. The projecting arm of each axle is connected to the vehicle frame through a spherical connection and serves as a support therefor together with a pair of laterally spaced ride cylinders. The arrangement is such that upon actuation of the steering cylinders, each rear axle is pivoted about a vertical axis passing through the associated spherical connection to provide steering movement of the axles with the ride cylinders being positioned at angles favorable to increased side stability.

3,831,962
STEERABLE TANDEM AXLE SUSPENSION

Dennis W. Cator, London, Ontario; Roger W. Campbell, Melbourne, Ontario, and Gerardus L. Felix, London, Ontario, all of Canada, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 12, 1973, Ser. No. 396,572
Int. Cl. B62d *13/02*
U.S. Cl. 280—81 A **4 Claims**

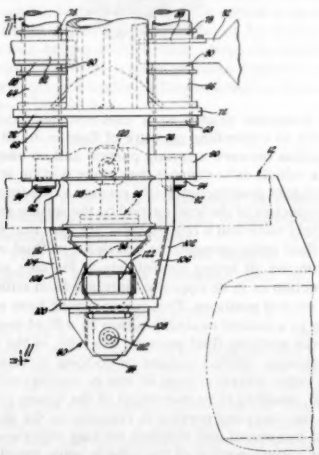


A steerable tandem axle suspension for supporting the rear end of a vehicle frame and including first and second transversely extending rear axles each having rotatable wheels at the opposite ends thereof. Each of the axles is formed with a housing having an arm which projects towards the other axle and a steering actuator is located between the axles. The projecting arm of each axle is supported by the steering actuator while the axle housing has an upper portion thereof connected by a swivel assembly to the vehicle frame. The arrangement is such that upon movement of the steering actuator, each rear axle is pivoted about a vertical axis passing through the associated swivel assembly to provide steering movement of the axles.

3,831,963
STEERING ACTUATOR FOR TANDEM AXLES

Roger W. Campbell, Melbourne, Ontario; Edvards B. Aukmanis, and Milan Placko, both of London, Ontario, all of Canada, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 12, 1973, Ser. No. 396,574
Int. Cl. B62d *13/02*
U.S. Cl. 280—81 A **3 Claims**

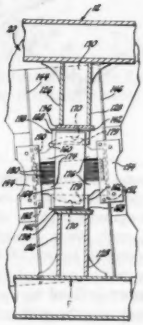


A steering actuator for tandem axles in which each axle has a central portion connected to a vehicle frame for movement about a vertical steer axis. The actuator includes a pair of parallel rods located between the axles and supported for conjoint axial movement along transverse axes. Each axle is joined through a spherical connection to one of the rods and power-operated means are provided for causing the rods to be shifted along their longitudinal axes for simultaneously rotating each axle about its vertical steer axis.

3,831,964
SWIVEL ASSEMBLY FOR STEERABLE AXLE

Roger W. Campbell, Melbourne, Ontario; Edvards B. Aukmanis, and Milan Placko, both of London, Ontario, all of Canada, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 12, 1973, Ser. No. 396,573
Int. Cl. B62d *13/02*
U.S. Cl. 280—81 A **4 Claims**

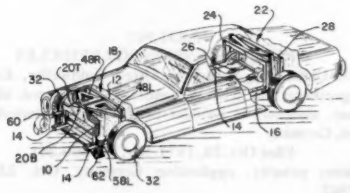


A swivel assembly for connecting a transverse axle member to a vehicle frame member and adapted to be located in a slot formed in one of the members to allow the axle member to be steerable about a vertical steer axis and to oscillate about a horizontal axis. The swivel assembly includes a cushioning device having a plurality of resilient pad members for absorbing side loads on the vehicle.

3,831,965
VEHICLE SUSPENSION SYSTEM

Charles V. Dickens, P.O. Box 544, Alamosa, Colo. 81101

Filed Jan. 15, 1973, Ser. No. 323,884
Int. Cl. B60g *3/04*
U.S. Cl. 280—96.2 R **10 Claims**



This invention relates to a suspension system for automotive vehicles and the like characterized by front and rear pairs of hingedly interconnected dogleg frame elements that coact with one another and with an overhead centrally located longitudinal hinge axis to minimize tilt and sway by transferring the sidewise loads inducing the latter across the vehicle to the springs on the opposite side.

3,831,966
AUTOMOBILE SUSPENSIONS

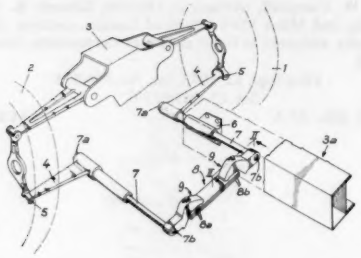
Albert Grosseau, Chaville/Hauts-de-Seine, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed June 19, 1972, Ser. No. 264,258

Claims priority, application France, June 23, 1971, 71.22914

Int. Cl. B60g *11/20*

U.S. Cl. 280—124 B **8 Claims**



This invention relates to a suspension of a group of wheels of a vehicle, comprising two wheels located respectively on either side of the longitudinal plane of this vehicle and two suspension devices, each being constituted by at least one anti-roll bar and belonging to one of the two wheels, whilst each wheel is connected to one end of its suspension device and an elastic member is fixed to each of the ends of the suspension devices opposite the ends connected to the wheels, by coupling means, which are distinct from said elastic member and which are constituted by a part comprising two support elements between which the elastic member is disposed and by a member for fixing the suspension device in question to said coupling means, wherein the part comprising the two support elements is constituted by an arm which is provided on the one hand with the fixing member, on the other hand with a swell constituting a first of the two elements for supporting said part on a first face of the elastic member, and by a tie-rod integral with the arm and provided with a shoulder which is distant from the face of the arm provided with the swell, disposed opposite the said face and which constitutes the second of the two support elements of the part on a second face of the elastic member, which is opposite the first afore-mentioned face of said elastic member. The suspension described is applicable in particular to the manufacture of automobile vehicles.

3,831,967
WHEEL SUSPENSION FOR VEHICLES

Rudolf Uhlenhaut, Stuttgart; Alfred Rothweiler, Esslingen-Hegensberg, and Erich Waxenberger, Neuhausen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

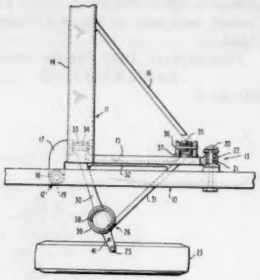
Filed Oct. 24, 1972, Ser. No. 300,261

Claims priority, application Germany, Oct. 23, 1971, 2152962

Int. Cl. B60g *3/10*

U.S. Cl. 280—124 A **41 Claims**

A wheel suspension for vehicles, especially for motor vehicles, in which each wheel of two wheels of a wheel pair disposed opposite one another are elastically supported at the vehicle superstructure by means of two superposed guide members or by means of one guide member and at least one further guide element with the use of a cross bearer member, itself elastically supported at the vehicle superstructure; only those guide members of the two wheels of the wheel pair of wheels, which are loaded by the vehicle spring system are



thereby elastically supported on the cross bearer member independently of the other guide members which are then supported directly at the vehicle superstructure.

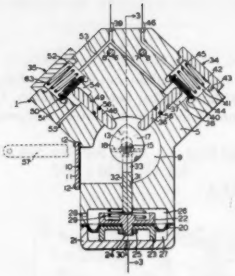
3,831,968
PRESSURE CONTROL VALVE DEVICE WITH A TWO-POSITION CAM ACTUATOR FOR CONTROLLING PRESSURE IN A VEHICLE AIR SPRING

Ronald J. Shaffer, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed July 30, 1973, Ser. No. 383,908

Int. Cl. B60g *17/00*

U.S. Cl. 280—124 F **10 Claims**



This invention relates to a cam-actuated control valve device for so controlling pressure of fluid in an air spring for interposition between a sprung portion and an unsprung portion of a vehicle as to support the sprung portion at a substantially constant preselected height relative to the unsprung portion irrespective of the load carried by the sprung portion.

A supply valve and a release valve are operated by a cam to supply fluid under pressure to or release of fluid under pressure from the air spring accordingly as the cam is rocked in one direction or in an opposite direction from either one of a pair of neutral positions. The cam is moved from one neutral position to a second neutral position by a fluid motor subject to a brake applying fluid pressure whereby, in the absence of such pressure, limited arcuate or rocking movement of the cam in either direction from its one or corresponding neutral position, resulting from movement of the sprung portion relative to the unsprung portion in response to the shocks, jolts, vertical movement and sidewise rocking experienced by the body or sprung portion of the vehicle while traveling at high speed, is obtainable without effecting operation of either valve to change the pressure in the air spring. On the other hand,

upon the supply of the brake applying fluid pressure to the fluid motor, the cam is so positioned in its second neutral position that any degree of rocking in either direction from this second neutral position causes a change in the pressure in the air spring that is proportional to this degree of rocking.

3,831,969

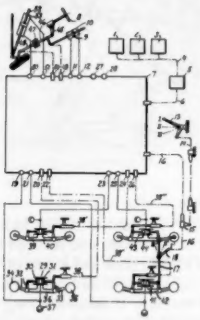
SYSTEM FOR REGULATING THE HEIGHT OF THE BODY OF A VEHICLE ABOVE THE GROUND AND FOR INCLINING THE VEHICLE LATERALLY RELATIVE TO THE VEHICLE SUPPORTING MEANS

K. Julius Lindblom, Manhemsvagen 11A, 191 45, Sollentuna, Sweden

Continuation-in-part of Ser. No. 104,674, Jan. 7, 1971, abandoned. This application Sept. 7, 1972, Ser. No. 287,049

Int. Cl. B60g *17/04*

U.S. Cl. 280—124 F **14 Claims**



A system or apparatus for regulating the height of a vehicle body relative to the ground and for tilting said body laterally in relation to its supporting means including a laterally movable weight which deviates from a desired attitude as a result of the forces acting therein. The weight actuates a distribution valve when moved from its neutral position to distribute pressure medium, responsive to the movement of the weight, to piston-cylinder means adapted to regulate the height of at least one side of the vehicle body in relation to the vehicle body support means. A height regulating valve actuated by means which sense the mean height of the vehicle above the vehicle supporting surface and which supplies pressure medium to piston-cylinders arrangement to effect lifting or lowering of said vehicle body also is provided.

3,831,970

FRONT WHEEL SUSPENSION FOR MOTOR VEHICLES

Alf Muller, Bittenfeld, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

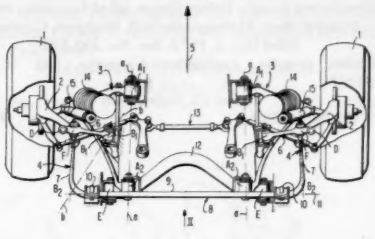
Filed Aug. 15, 1973, Ser. No. 388,658

Claims priority, application Germany, Dec. 30, 1972, 2264300

Int. Cl. B60g *11/50*

U.S. Cl. 280—124 A **18 Claims**

A front wheel suspension for motor vehicles with a wheel guide system formed by two superposed cross guide members on each side of the vehicle of which the lower cross guide member which has a pivot axis extending in the vehicle longitudinal direction includes a substantially transversely extending front arm and an obliquely rearwardly inwardly extending rear arm while the upper cross guide member includes a guide rod extending essentially in the vehicle transverse direction; the upper cross guide member thereby has a pivot axis extending obliquely outwardly from in front toward the rear while a U-shaped torsion rod is connected with its forwardly extending arms to the corresponding guide rods of the upper cross guide members to thereby form in effect the associated rear guide arms of the upper cross guide members.



3,831,971

SAFETY BELT WINDING ENERGY ACCUMULATOR DEVICE FOR USE IN VEHICLES

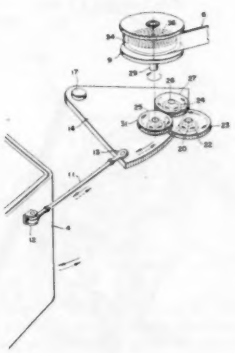
Yuichiro Kaneko; Fuminori Teraoka; Tatsushi Kubota, and Takehiko Nishikawa, all of Aichi, Japan, assignors to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, Nishikasugai-gun, Aichi-Pref., Japan

Filed Oct. 27, 1972, Ser. No. 301,491

Claims priority, application Japan, Nov. 4, 1971, 46-87870

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 SB **8 Claims**



A safety belt winding energy accumulator device for use in a vehicle, which is so designed that when a door of the vehicle is opened and closed, energy is accumulated in a spiral spring through a transmission shaft which is driven by the door opening and closing operation or a motor, and the accumulated energy is supplied to a pulley having a tape connected thereto at one end, the other end of which is connected a belt webbing, to rotate the pulley, whereby the belt webbing is drawn up from its engaging position by way of the tape.

3,831,972
INFLATABLE GAS CUSHION FOR PASSENGER PROTECTION OF VEHICLES, ESPECIALLY MOTOR VEHICLES

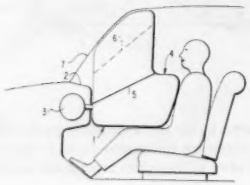
Rudolf Allgaier, Nagold; Luigi Brambilla, Sindelfingen, and Hansjurgen Scholz, Echterdingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Oct. 6, 1972, Ser. No. 295,572

Claims priority, application Germany, Oct. 8, 1971, 2150257

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **4 Claims**



An inflatable gas cushion for the protection of the passengers of vehicles, especially of motor vehicles, in which the side of the inflatable gas cushion facing the user is constructed offset step-shaped in such a manner that an impact surface for the head of the user which is formed thereby is essentially horizontal or only slightly inclined with respect to the horizontal when the gas cushion is inflated.

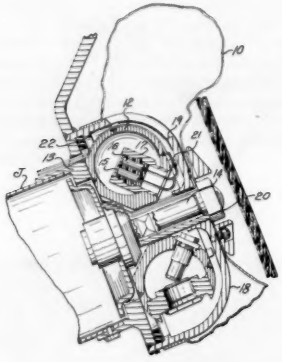
3,831,973
VEHICLE OCCUPANT RESTRAINT SYSTEM

George B. K. Meacham, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 8, 1972, Ser. No. 313,283

Int. Cl. B60r *21/08*

U.S. Cl. 280—150 AB **6 Claims**



A safety system for vehicle driver restraint of the type using a collapsed inflatable confinement mounted on the steering column. The confinement is inflated by a collision sensor-actuated explosive charge which activates a fluid pressure source in one embodiment and fluid is discharged to the confinement through a diffuser disposed centrally and annularly about the reservoir. The annular fluid source is nonrotatably attached to the steering column mast jacket and a rotary fluid pressure seal is provided between the diffuser and the steering column mast jacket. In one embodiment of the invention, the fluid pressure supply is a solid propellant gas generator nonrotatably mounted to the steering column mast jacket. In another embodiment, the fluid pressure source is a toroidally shaped reservoir containing fluid stored under pressure.

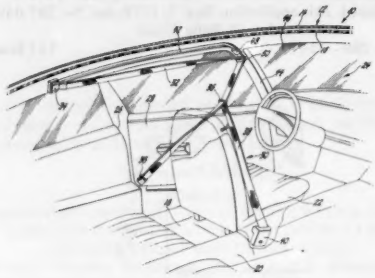
3,831,974
PASSIVE RESTRAINT BELT ARRANGEMENT FOR A VEHICLE OCCUPANT

Charles M. Keppel, Holly, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 1, 1973, Ser. No. 366,169

Int. Cl. B60r *21/02*

U.S. Cl. 280—150 SB **2 Claims**



A vehicle body occupant restraint belt arrangement in which a restraint belt has one end secured to the lower rearward portion of a vehicle door and has its other end secured to the vehicle roof rearward and outboard of a seat adjacent the door. A control member is slidable along the intermediate portion of the restraint belt and attaches one end of a control belt whose other end is received by a vehicle sensitive inertia locking belt retractor positioned inboard of the seat adjacent a lower rearward seat portion. The retractor normally retracts the control belt to pull the control member inward and thereby defines the restraint belt into lap and shoulder belt portions positioned across a seated occupant in a restraining position when the vehicle door is closed. A guide along the upper edge of the door opening mounts a slide member that is movable forwardly and rearwardly by a drive mechanism responsive to an operative condition of the vehicle. The drive mechanism moves the slide member rearwardly when the vehicle is placed in this operative condition so that the belt arrangement moves without any deliberate occupant effort to the restraining position when the door is closed. When the vehicle ceases to be in this operation condition, the drive mechanism moves the slide member forwardly and moves the restraint belt to a generally forwardly pointing easy-enter position so as to free the occupant. Door opening movement then moves the lower portion of the restraint belt to an outwardly extending inclined configuration so that the control member slides upwardly on this belt portion and lifts the control belt to afford an occupant convenient egress from or ingress to the vehicle body free of the belt arrangement.

3,831,975
SAFETY DEVICE FOR MOTOR VEHICLES

Leon Mednikow, 290 9th Ave., New York, N.Y. 10001

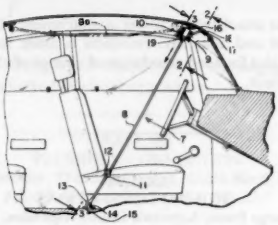
Filed Sept. 17, 1973, Ser. No. 397,981

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 B **4 Claims**

This invention is directed to a safety device for a motor vehicle such as an automobile, a truck or truck cab, a speed boat, an air plane, or the like, which in a preferred embodiment the front seat passenger's seat and driver's seat is made more safe against fatal accidents or injuries of a severe nature to passanger and/or driver in major impact collisions involving

the motor vehicle, the safety device being a safety net which extends between two guide wires extending from a forward overhead ceiling of the automobile to a rearwardly lateral position on either side of the seat along which paired parallel guide wires the net is slidable to open-up the net, the top of the net being anchored at the top of the guide wires or flexible cables and between the guide wires while the base of the net slides down the guide wire, each side of the seat bringing the base of the net and a steel cord having appropriate padding therearound across the lap in the nature of a seat belt, and at the base of the net on each guide wire there being a snap device such that when the net drops it will be locked into the down position but the locking device being an easily releasable locking device for ease in escaping from the net in the event of a serious accident to avoid accidental trapping of the passenger or driver within the automobile compartment (for



example) in the event of fire. The release of the net is brought about or actuated by preferably an inertia switch registering impact above a predetermined level. Also in a preferred embodiment there is included a cartridge element associated with the release mechanism for the net such that upon impact and the predetermined amount of inertia the cartridge is fired to propel the base of the net downwardly thereby increasing the speed with which the net drops and also avoiding any possibility of the net not dropping because offorward momentum of the net and therefore friction along the guide members and/or torque in an upward direction. The net as it drops, drops slightly rearwardly of the steering wheel in a preferred embodiment, but forwardly of the upper body and face of the driver and the front-seat passenger, while the steel strap extending along the base of the net serves to further facilitate inhibition of or against the body of the person(s) being thrown forwardly from the seated position.

3,831,976

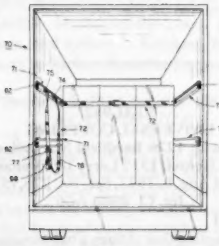
CARGO TIE-DOWN SYSTEM

Ray J. Iden, Sr., 6744 N. Lightfoot Ave., Chicago, Ill. 60646

Continuation-in-part of Ser. No. 160,773, July 8, 1971, abandoned. This application Nov. 17, 1972, Ser. No. 307,576

Int. Cl. B60p *7/00*

U.S. Cl. 280—179 A **8 Claims**



A cargo tie-down system includes elongated tracks in which a plurality of fittings to which flexible straps are connected are slidably and irremovably mounted therein for preventing unauthorized removal of the fittings and straps.

3,831,977

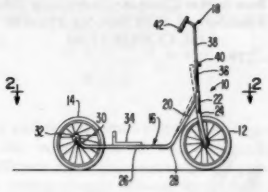
SELF-PROPELLING VEHICLE

David E. Osborne, 14556 Harvard Ct., Los Altos Hills, Calif. 94022, and Harold M. Knoerle, 950 Continental Dr., Menlo Park, Calif. 94025

Filed June 14, 1972, Ser. No. 262,862

Int. Cl. B62m *1/00*

U.S. Cl. 280—229 **7 Claims**



A vehicle of the type wherein the rider shifts his body up and down to drive an eccentrically mounted wheel mounted on the rear end of a frame composed of a pair of spaced, resilient bars. Each bar has a front, forwardly inclined segment integral with a respective central segment, each front segment being displaceable rearwardly relative to the corresponding central segment to add to the torque applied to the rear wheel during the acceleration phase of each revolution thereof. Adjustable handlebar means is coupled with the front wheel of the vehicle.

3,831,978

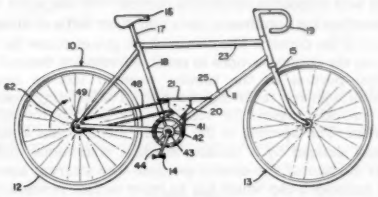
DRIVE TRANSMISSION FOR A BICYCLE OR THE LIKE

David Dunder, Glendora, and Sheldon Wiley, Los Gatos, both of Calif., assignors to Trans World Products, Inc., San Jose, Calif.

Filed Mar. 12, 1973, Ser. No. 340,194

Int. Cl. B62m *23/00*

U.S. Cl. 280—238 **12 Claims**



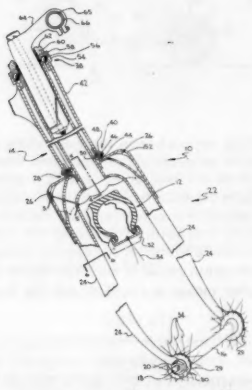
A drive transmission for a bicycle or the like including a housing having a pair of spaced shafts journaled for rotation within the housing. A sprocket is fixedly secured to each of the shafts and a plurality of spaced cams are mounted off-center on one of the shafts for rotation with respect to the shaft on which they are mounted. A like number of spaced one-way clutches are mounted on the other shaft for free rotation in one direction with respect to the other shaft and fixed rotation in the other direction with respect to the other shaft. The clutches are aligned with their respective cams and resilient means interconnect each of the clutches with its aligned cam. In this manner, when the sprocket on the shaft having the cams thereon is rotated, such as by a bike pedal connected thereto, the clutches are turned in the one-way direction for a short distance on their respective shafts due to the intercon-

necting resilient means. If a resistance to turning is placed on the shaft having the clutches thereon, such as by interconnection of the rear wheel of a bike to the sprocket thereon, more tension is placed on the resilient means than it can overcome. Accordingly, the resilient means, which may be either an extension or compression spring, extends or compresses to rotate clutches to a lesser degree, thereby automatically changing the turning ratio between the pedal sprocket and the rear wheel.

3,831,979
STEERING ASSEMBLY

Martin R. Baginski, Austinburg Township, Ohio, assignor to Ashtabula Bow Socket Company, Ashtabula, Ohio

Filed Nov. 4, 1971, Ser. No. 195,620
Int. Cl. B62k *21/04*
U.S. Cl. 280—279 **16 Claims**



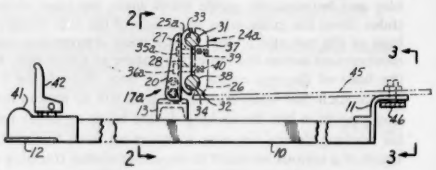
This disclosure relates to a steering assembly for supporting the wheel of a wheeled vehicle for steering movement relative to the frame of the vehicle. The steering assembly includes a tubular member having a central portion, end portions for supporting the wheel of the wheeled vehicle and corner portions connecting the end portions to the central portion. Each of the end portions of the tubular member are formed at an angle with respect to the central portion. The one piece tubular member has continuous inner and outer surfaces along the extent of the corners. The corners have gusset means for reinforcing the corner portions to resist deformation thereof. The central portion of the tubular member has an opening therethrough for receiving the post. The steering assembly also provides means for securing the post to the tubular member. The opening in the tubular member has a portion thereof defined by a surface which is continuous with the outer surface of the central portion. The steering assembly also includes a cap which has an inner surface positioned adjacent to the outer surface of the central portion of the tubular member. The cap has an opening therethrough which is coaxial with the opening of the tubular member and is defined by a post receiving surface continuous with the inner surface of the cap. The cap has an outer surface portion for receiving bearing means thereon to provide a rotational mounting between the wheeled vehicle frame and the steering assembly.

3,831,980
TOW BAR MEANS

August A. Kniff, 137 S. Eucla, San Dimas, Calif. 91773

Filed Dec. 13, 1972, Ser. No. 314,740
Int. Cl. B62d *53/04*
U.S. Cl. 280—402 **5 Claims**

There is disclosed a tow bar device for towing a four-wheeled vehicle. The tow bar has a tongue at the rear for engagement with a yoke attached beneath the vehicle and a cross-bar at the position of the front end assembly with upstanding supports at the ends of the cross-bar. The upstanding

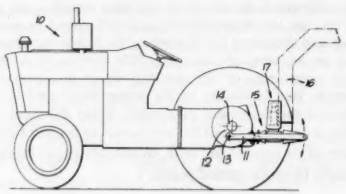


supports are attachable to pivots at attachment plates secured at the front end assembly. Provision is made for two pivot points and also for accommodation of a range of elevations for the attachment.

3,831,981
TOWING CONNECTIONS

Harold George Poole, Aspenden House, Aspenden, England

Filed Nov. 29, 1972, Ser. No. 310,580
Claims priority, application Great Britain, Nov. 30, 1971, 55545/71
Int. Cl. B60d *1/00*
U.S. Cl. 280—479 R **8 Claims**



A towing connection comprises two conventional power operated vertically moving swing arms on a tractor between which a first part is mounted to pivot about an axis extending fore and aft of the vehicle. A second part mounted on a tractor is rotatably supported on the first part for rotation about an upright axis. A locking device holds the first and second parts together so that the connection is rigid in a vertical plane and articulation in a vertical plane takes place at the attachment points of the lift arms to the tractor.

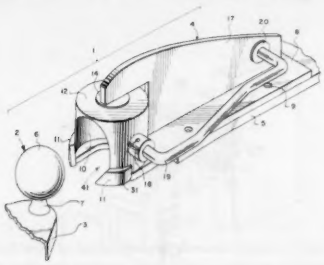
3,831,982
UNIVERSAL COUPLING

Brian M. Bernhardt, 1226 Bardfield St., Dallas, Tex. 75041, and Edward A. Genzel, 1317 Larry Dr., Dallas, Tex. 75041

Filed Aug. 8, 1972, Ser. No. 278,756
Int. Cl. B60d *1/06*
U.S. Cl. 280—511 **5 Claims**

A spherical coupling that utilizes a ball structure attached to one part to be coupled, and a socket structure that attaches to the other part to be coupled. One embodiment of the improvement structure disclosed utilizes a front opening housing hav-

ing a stationary cam therein and a rotating outer shell that engages the ball and causes it to seat in the socket upon rotation

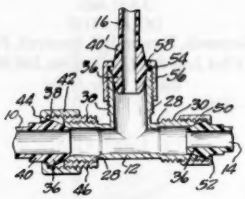


of the outer shell. Upon completion of the engagement, the outer shell is locked in a holding position.

3,831,983
PLUMBING CONNECTION

Charles F. Stickler, 57455 Poppy Rd., South Bend, Ind. 46619

Filed July 20, 1973, Ser. No. 381,253
Int. Cl. F16l *41/00*
U.S. Cl. 285—12 **5 Claims**



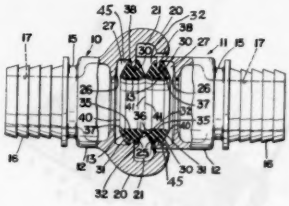
A plumbing connection wherein preformed tubes of a selected range of diameters cooperate with a connecting member having a passage of standard diameter. The tubes of all sizes in the selected range have tapered ends, each of whose outer small diameter portions is receivable in said passage and whose innermost large diameter portion is of a diameter greater than the diameter of the passage. Each tube carries slip nuts for pressing said tapered tube ends into circumferential sealing engagement with a connecting member when abutting the large end of a tapered tube portion and screw threaded on said connecting member.

3,831,984
QUICK DISCONNECT COUPLING

Thomas J. Kutina, Mentor-on-the-Lake; James P. Staten, North Madison, and Sydney L. Kershaw, South Euclid, all of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Nov. 8, 1971, Ser. No. 196,629
Int. Cl. F16l *37/24*
U.S. Cl. 285—73 **2 Claims**

A quick coupling comprising a pair of coupling elements adapted to be connected to each other, each element having a deformable annular gasket retained on an inturned flange at an end of the element for sealing engagement with each other at their outer end faces when the coupling elements are connected. The outer and inner end faces of the gaskets are frusto-conical and the gaskets are symmetrical about a central plane so as to be reversible. The gaskets at their inner ends have an initial clearance with transverse and circumferential walls of the coupling elements to permit rocking of the gaskets about the flange whereby during axial connecting movement of the two elements the frusto-conical outer gasket faces rock and deform into a planar position with a minimum of mass deformation during a major part of the connecting movement

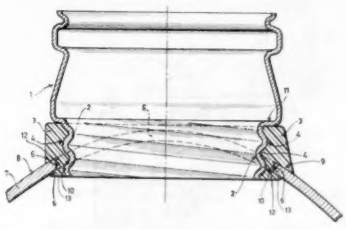


and with the gasket inner ends engaging the transverse shoulders near the completion of the connecting movement whereby sufficient mass deformation of the gaskets occurs to increase the sealing contact between the gaskets and to ensure adequate resistance to disconnect movement of the elements.

3,831,985
PIPE CONNECTION

Albertus Anthony Oostenbrink, Hardenberg, Netherlands, assignor to Industriele Onderneming Wavin N.V., Zwolle, Netherlands

Filed Jan. 4, 1972, Ser. No. 215,293
Claims priority, application Netherlands, Jan. 8, 1971, 7100263
Int. Cl. F16l *41/00*
U.S. Cl. 285—162 **4 Claims**



Pipe connection comprising a pipe and a branch pipe being connected by means of a sleeve having an inner helical profile corresponding to the profile of the branch pipe and a groove for receiving the edge of an opening in the pipe.

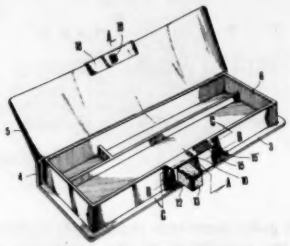
3,831,986
CONTAINER HAVING MAGNETIC AND LATCH FASTENING MEANS

Sanzo Kobayashi, No. 34-9, Ryusen 3-chome, Tokyo, Japan (110)

Filed Aug. 9, 1972, Ser. No. 279,182
Int. Cl. E05c *3/06*
U.S. Cl. 292—201 **8 Claims**

A container such as a pencil case comprises a bottom tray and a cover which is engagable over the tray and which is advantageously pivotally connected to one side thereof and is positionable in a closed position in which an eyelet portion of a latching mechanism is engaged within a receiving opening of a hollow space in which a latch member is pivotally mounted. The device includes magnetically operable latch means for locking the cover into position closing the tray and which includes the eyelet on one of the parts, e.g., the cover and a

hook mounted in a recess of the other part, i.e., the bottom portion. Spring means are associated with the latch for biasing it toward one of the operating positions, e.g., a latched or closed position and a magnet is employed which may be inserted into a receiving recess of the case for moving the latch to the other of the positions, e.g. an open position. The cover



advantageously includes an additional magnet for holding a plate secured on the cover part in a magnetically closed position. The container advantageously includes an outer cover wall part covering at least some of the inner walls thereof and the top or lid is hinged to the outer portion of the double wall of the part.

3,831,987

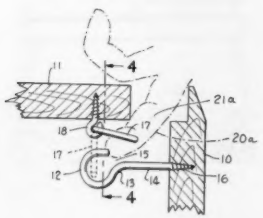
SAFETY FASTENING DEVICE

Ernest L. Misenheimer, III, Rt. 1, Box 60-D, Valdese, N.C. 28690

Filed Mar. 9, 1973, Ser. No. 339,898

Int. Cl. E05c *3/04*

U.S. Cl. 292—246 **1 Claim**



A safety fastening device for use in preventing opening of a storage compartment by a young child and the like has a partially open hook with a shank defining an opening on one side of the shank between the shank end and a free end of the hook and means for suspending a ring from an upper surface of the frame so that the ring extends pivotally downwardly therefrom toward said hook and extends transversly thereof across the opening so that when the closure is partially opened the ring will pass through the opening and be received upon the hook as to require lifting by an instrument inserted through a partially open frame before the frame can be fully opened.

3,831,988

STRIKE PLATE/FACE PLATE FOR DOOR LATCHES

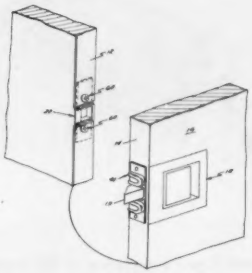
Gerard N. Stelma, Grand Rapids, Mich., assignor to Keeler Brass Company, Grand Rapids, Mich.

Filed Jan. 23, 1973, Ser. No. 325,992

Int. Cl. E05c *1/06*

U.S. Cl. 292—302 **17 Claims**

A strike plate/face plate combination especially adapted for use with vehicular doors which are subjected to multi-directional forces tending to both separate the door and door jamb and swing open the door. A low-profile strike plate includes adjustable, shouldered screws which engage an oppos-



ing low-profile, face plate to prevent separation of the door and door jamb. A central aperture in the strike plate is engaged by an opposing lock bolt to prevent the door from swinging open.

3,831,989

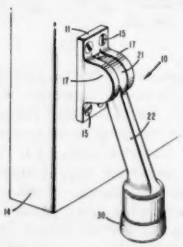
DOOR STOP

Vernon W. Gurzenda, Parsons Hill, Somerset, Pa. 15501

Filed June 8, 1972, Ser. No. 260,803

Int. Cl. E05c *17/44*

U.S. Cl. 292—338 **7 Claims**



A detent spring for holding an arm adapted to be moved in a vertical arc and a door stop having the usual pivoting arm in combination with said spring, said spring holding the arm in adjusted positions and holding the arm within a base attached to the lower portion of a door.

3,831,990

BUMPER GUARD AND SIDEWALL PROTECTOR

Bhupindar Singh, Northridge, and Donald A. Swauger, Chatsworth, both of Calif.

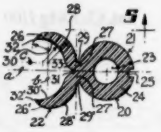
Filed July 26, 1973, Ser. No. 382,905

Int. Cl. B60r *19/00*

U.S. Cl. 293—1 **5 Claims**

A unitary homogenious structure of resilient material on the order of rubber, neoprene and the like in the form of an im-

pact absorbing bead on an integral mounting base in which a pair of adhesive bearing crescent-like skirts extend symmetrically rearwardly from the bead at hinge-like segmental portions and tend to have internal stresses when pressed into adherance with any surface on a vehicle body to cling thereto for securing such bead in a foremost impact receiving position therefrom.

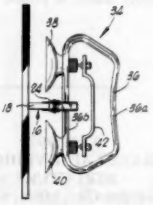


3,831,991

APPARATUS AND SYSTEM FOR GAINING ACCESS TO CONFLAGRATIONS

John R. Lukeman, 2809 N.W. Expwy., Oklahoma City, Okla. 73112

Filed Jan. 12, 1973, Ser. No. 322,953
Int. Cl. A47f 7/00
U.S. Cl. 294—64 R **5 Claims**



An apparatus for maintaining ready availability of a lifter tool adapted to lift flat floor panels to expose a fire therebeneath, the apparatus consisting of a flat mounting plate adapted for securement to a wall or other vertically extending surface, a clip bracket centrally secured on said plate, and a lifter tool having a pair of spaced lifter elements occupying substantially the same plane, and interconnected by a bridging handle member frictionally engaged by the bracket in a position to face the lifter elements toward the plate. The invention further includes the described apparatus in combination with a room including a vertical wall upon which said apparatus is mounted by securement of the mounting plate thereto, a fire extinguisher exposed on said wall adjacent said apparatus, and a floor in the room comprising a plurality of flat panels supported above a sub-floor to define therewith a space containing electrical cables connected to a computer disposed in the room.

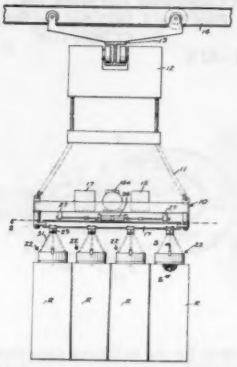
3,831,992

ROLL HANDLING APPARATUS

Dale H. Francois, Salem, Ill., assignor to American Chain & Cable Company, Inc., New York, N.Y.

Filed Jan. 26, 1973, Ser. No. 326,613
Int. Cl. B66c 1/02
U.S. Cl. 294—65 **58 Claims**

An apparatus for handling rolls of wound material which comprises a frame on which a plurality of roll supporting heads are adjustably mounted. Each head is of the vacuum type and includes a probe that is engaged with the end of the roll and moved with respect to the head until the probe engages the opening in the center of the end of the roll whereupon the head is actuated to cause vacuum to be applied for lifting the roll.

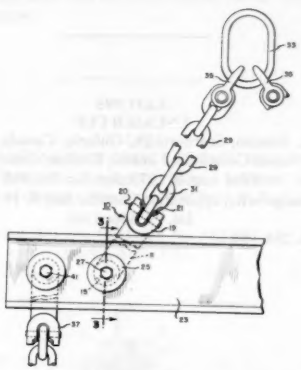


3,831,993

SPREADER BEAM FITTING

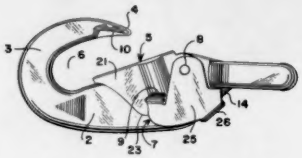
Walker E. Drayton, and Elwood L. Krout, both of York, Pa., assignors to American Chain & Cable Company, Inc., New York, N.Y.

Filed Mar. 15, 1972, Ser. No. 235,004
Int. Cl. B66c 1/16
U.S. Cl. 294—81 R **4 Claims**



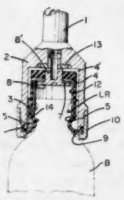
This invention relates to a spreader beam assembly in which a pair of steel channels are arranged back to back in spaced relation to one another to form a beam. A beam fitting is positioned at each end of the beam in the space between the steel channels. The beam fitting includes an elongated arm with a bridle fitting at one end thereof to which a bridle chain is secured. The other end of the fitting is terminated in a boss portion which has a hole therethrough. The boss portion is inserted through aligned holes in the steel channels with the boss thereby supporting the weight of the steel channels and the force exerted on the channels by the object being hoisted. Bridle chains are attached to the bridle fitting portion of each beam fitting and are secured to a master link at the opposite end thereof by means of a coupler. A similar beam fitting is secured at each end of the beam to which are attached dropper chains which support the load being hoisted.

3,831,994
SAFETY HOOK
Robert Martin, Fort Smith, Ark., assignor to United States Forgecraft Corporation, Fort Smith, Ark.
Filed June 4, 1973, Ser. No. 366,269
Int. Cl. B66c 1/36
U.S. Cl. 294—82 R 6 Claims



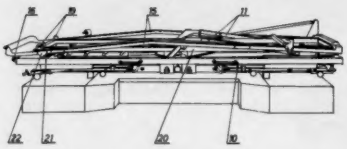
A safety hook for use in lashing equipment, load supports, safety harness, and the like, include a hook having a shank and a latch member mounted on a pin having its axis transversely of the hook shank and having a tongue engaging the hook nose to normally prevent removal of a connector engaged with the hook. The latch member has a portion engageable by a keeper in first position to prevent opening a hook portion of the shank. The keeper is movable transversely of the shank to a second position to release the latch member for movement thereof for access through the hook opening. Resilient members urge the latch member and keeper toward hook closing positions and maintain same therein until favorably maintained. The latch member and the keeper are movable in substantially normal or perpendicular planes whereby simultaneous accidental movement of both is highly unlikely.

3,831,995
UNCASER CUP
Alex R. Duncan, Scarborough, Ontario, Canada, assignor to The Molson Companies Limited, Rexdale, Ontario, Canada
Filed Aug. 8, 1973, Ser. No. 386,808
Claims priority, application Canada, June 8, 1973, 173614
Int. Cl. B66c 1/46
U.S. Cl. 294—90 3 Claims



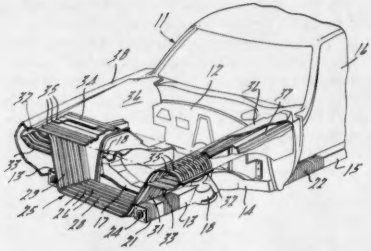
The invention relates to a bottle pick-up device where a rubber liner within a cup or holder is inflated by air so as to grip the top of the bottle with a metal insert being located within the liner so that inflation of the latter will only occur at its lower operative end instead of throughout its length thereby effecting a more positive gripping action between the top of the bottle and the rubber liner.

3,831,996
STRETCHER SUPPORT ARRANGEMENT ESPECIALLY FOR AMBULANCES
Siegfried Layer, Lorch/Wuerttemberg, Germany, assignor to Binz & Co., Lorch/Wuerttemberg, Germany
Filed Jan. 4, 1973, Ser. No. 321,043
Claims priority, application Germany, Jan. 8, 1972, 2200814
Int. Cl. A61g 1/00
U.S. Cl. 296—19 14 Claims



A stretcher support arrangement for ambulances in which a stretcher support frame is mounted movable between a substantially horizontal rest position located within the ambulance and an extended position partly outwardly withdrawn therefrom and with the outwardly extending end downwardly tilted on frame means fixed to the floor of the ambulance. Links guided in guide rails are connected to the stretcher support frame to move the latter automatically to its tilted position when the support frame is pulled towards its extended position.

3,831,997
CONTROLLED COLLAPSE VEHICLE FRONT END STRUCTURE
Robert A. Myers, Garden City, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Mar. 22, 1973, Ser. No. 343,744
Int. Cl. B62d 25/00
U.S. Cl. 296—28 R 4 Claims

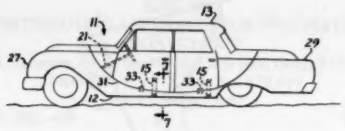


A controlled collapse vehicle front end structure comprising a laterally corrugated loop means extending from the front end of the vehicle frame structure toward the dash panel. Upon a high speed frontal impact, the corrugations fold flat upon themselves providing longitudinal deformation with a constant load rate.

3,831,998
AUTOMOBILE CONSTRUCTION FOR SAFETY OF OCCUPANTS

Harlan D. Hewitt, 1210 Astor St., Chicago, Ill. 60610

Filed Mar. 13, 1972, Ser. No. 234,080
Int. Cl. B62d 1/18, 27/06
U.S. Cl. 296—35 R 9 Claims

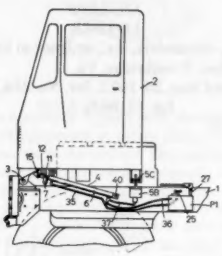


A safety construction for vehicles wherein a separable passenger compartment is releasably secured to a chassis, a bumper and chassis interlock tie colliding vehicles together as a unit, and a sectioned steering post collapses upon separation of the passenger compartment from the chassis.

3,831,999
LOST MOTION CONNECTION MEANS FOR HYDRAULIC PISTON-CYLINDER DEVICE

Lambertus Johannes Sonneborn, Oldenzaal, Netherlands, assignor to Applied Power Inc., Milwaukee, Wis.

Filed Dec. 6, 1972, Ser. No. 312,486
Int. Cl. B62d 27/06, 33/06
U.S. Cl. 296—35 R 13 Claims

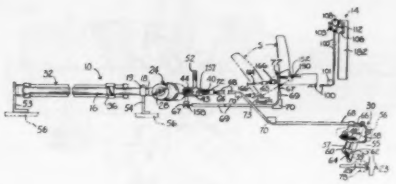


A hydraulic piston-cylinder device or tilt cylinder for tilting a truck cab relative to its chassis to permit access to the engine positioned below the cab comprises lost motion connection means which permit the main piston to remain stationary relative to the cylinder while permitting slight relative movement of the cab and chassis. One end of the cylinder is pivotally connected to the truck chassis by a pin. The cab is provided with a fixed cylindrical pin for connection to the free end of the piston through the lost motion connection means. In one embodiment, the pin slidably engages a slot provided in a connecting member rigidly secured to the free end of the main piston. In a second embodiment, the pin is connected to a cylindrical hole in the connecting member or sleeve which is slidably mounted on the free end of the piston and the connecting member and is further provided with a slot engageable with another cylindrical pin rigidly secured to the free end of the main piston. In a third embodiment, the connecting member is in the form of a small piston which is slidable in an axial bore provided in the free end of the main piston and the free end of the small piston is provided with a cylindrical hole for engagement with the pin on the cab. The fourth embodiment resembles the third embodiment in comprising a small piston but further comprises a fluid passage in the main piston interconnecting the axial bore and the cylinder and further comprises a free hydraulic piston slidably mounted in the bore between the small piston and the port of the passage.

3,832,000
VEHICLE SAFETY SYSTEM

Leo G. McDonnell, 19917 Kinloch, Detroit, Mich. 48240

Filed Jan. 4, 1973, Ser. No. 320,991
Int. Cl. B60r 21/08
U.S. Cl. 296—65 A 18 Claims

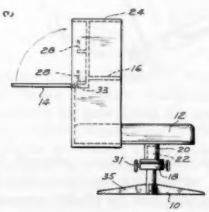


In a vehicle safety system for achieving vehicle safety for occupants upon collision of the vehicle, vehicle safety method comprising providing a force capable of moving a vehicle seat and any occupant thereof axially of the vehicle, latching the vehicle seat against the axial movement, latching both a spring powered pulling force and a fluid powered pulling force, both said last-mentioned pulling forces operative upon each other to augment their individual pulling forces, said last-mentioned pulling forces capable of being latched against operation, latching said last-mentioned pulling forces against operation until a collision of the vehicle occurs, sensing a collision of said vehicle, simultaneously unlatching in response to said sensing both the last-mentioned pulling forces upon the happening of the collision, and utilizing the operation of at least one of the last-mentioned pulling forces to unlatch the vehicle seat so that the latter can be moved axially of the vehicle by the force thereon.

3,832,001
COMBINATION OFFICE FURNITURE

Charles B. Robinson, Lexington, Mass., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 19, 1973, Ser. No. 352,435
Int. Cl. A47c 7/62
U.S. Cl. 297—188 1 Claim



A combination desk, bookshelf, and ottoman mounted on a base that allows the device to rotate. On one side of the ottoman, a bookshelf is attached. The back of the bookshelf forms a concealed desk top in the form of an extendable rotatable leaf.

3,832,002

AUTOMOTIVE RESTRAINT SYSTEM

Walter S. Eggert, Jr., Huntington Valley, and Michael J. Pavlik, Norristown, both of Pa., assignors to The Budd Company, Troy, Mont.

Filed Mar. 21, 1973, Ser. No. 343,321
Int. Cl. B60r 21/10
U.S. Cl. 297—216 12 Claims

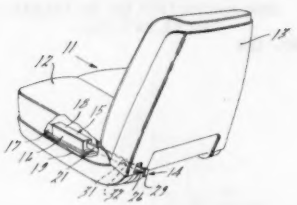
Vehicle seat safety system in which the occupant or passenger is closely restrained in the seat; the seat back is yieldably restrained in attenuation at a first and lower impact range for forward tilting movement with the occupant; and the seat is yieldably restrained in attenuation at a second and higher range for forward movement of the body and seat as a whole—to first allow the upper portion of the body or torso to move forward under lighter impact loadings, and to allow the body as a whole to move forward under greater impact loadings and thus to minimize, as far as possible, the impact loads on the body and to reduce forward and reverse or snapback loads on the body torso and neck.

3,832,003

ENERGY ABSORBING SEAT ASSEMBLY

Rudolph M. Horvat, Allen Park, Mich., assignor to The Ford Motor Company, Dearborn, Mich.

Filed Aug. 6, 1973, Ser. No. 383,945
Int. Cl. B60r 21/10
U.S. Cl. 297—216 4 Claims



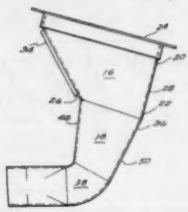
A vehicle seat assembly includes a generally horizontal seat structure and an upstanding backrest structure pivotally mounted on the seat structure for tiltable movement forwardly over the latter. An energy absorbing device mounted on one of the structures is releasably coupled through a latch device means to the other of the structures. The energy absorbing device is operative, when coupled through the latch device means to the other of the structures, to control forward tilting movement of the backrest structure in response to high external forces acting on the latter.

3,832,004

TRANSITION CHUTE

Paul Carwile, Colonial Hts., Va., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Sept. 13, 1972, Ser. No. 288,569
Int. Cl. B65g 53/04
U.S. Cl. 302—28 9 Claims



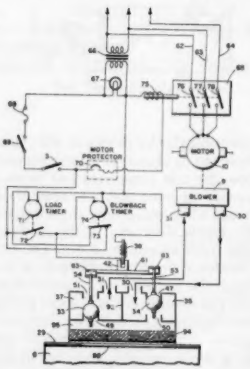
A transition chute directs tobacco from a tobacco feeder to a pair of pneumatic feed pipes and is designed to prevent choking when tobacco is conveyed through only one or both of the pipes. The chute includes a top section of decreasing cross-sectional area from top to bottom and a lower section connected thereto. The lower section defines a pair of spaced parallel pipe sections at its base for connection to the feed pipes. The lower section cooperates with the top section in providing a venturi effect which eliminates tobacco choking of the chute passageways.

3,832,005

LOADER

Homer C. Hek, Alexandria, Va., assignor to Universal Dynamics Corporation, Woodbridge, Va.

Filed May 24, 1972, Ser. No. 256,270
Int. Cl. B65g 53/40
U.S. Cl. 302—59 11 Claims



A loader of the type particularly useful in a dryer of the type which includes a vacuum operated loading chamber is disclosed. Material is drawn into the loading chamber through the action of a vacuum which is drawn on the loading chamber. The vacuum line, which is connected to the chamber, operates through a filter which prevents the material to be loaded from entering the vacuum line. In accordance with the present invention, the vacuum line is caused to operate through a pneumatic switch which periodically reverses the flow of air through the filter thus cleaning it. The cleaning or blowback operation is an improvement over prior art

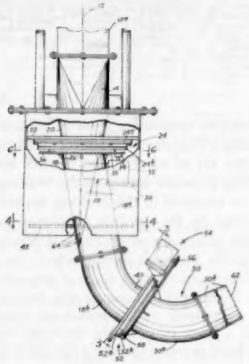
systems which perform the operation of reversing the air current to clean the filter by stopping the motor which was driving the vacuum blower and electrically reversing it. Thus, the present invention greatly increases system life by eliminating the wear and tear concomitant with the braking, reversing and restarting of the blower motor.

3,832,006

DISTRIBUTING APPARATUS FOR PNEUMATIC CONVEYOR

John A. Johnson, Rt. 2, Box 692E, Coos Bay, Oreg. 97420

Filed Feb. 5, 1973, Ser. No. 329,601
Int. Cl. B65g *53/42*
U.S. Cl. 302—60 **1 Claim**



A pneumatic conveyor system with distributing apparatus for controlling the direction in which pneumatically conveyed material is ejected from the system. The distributing apparatus includes a delivery conduit section normally depending from the discharge end of a pneumatic conveyor conduit, and a nozzle section receiving material from this delivery conduit section. The delivery conduit and nozzle sections may each include elbow or bend portions, with the bend portion of one forming substantially a continuation of the bend portion of the other. Power-operated relative adjustments of the nozzle section with respect to the delivery conduit section, and the delivery conduit section with respect to the pneumatic conveyor conduit, provide means for changing the direction in which material is ejected from the system. The nozzle section and the delivery conduit section form an adjustably positionable, sealed conduit means usable in the controlled discharge of bulk materials.

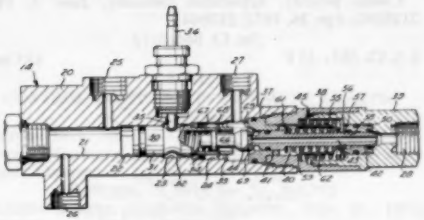
3,832,007

BLEND BACK PROPORTIONING VALVE

Richard G. Thrush, Cleveland, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed July 17, 1973, Ser. No. 379,931
Int. Cl. B60t *11/34*
U.S. Cl. 303—6 C **17 Claims**

A motor vehicle hydraulic brake system which includes a front brake circuit and a rear brake circuit. The rear brake circuit includes a blend back proportioning valve which controls the pressure in the rear brake circuit. The blend back proportioning valve includes a pressure reducing sleeve and a pressure intensifying piston. The pressure reducing sleeve in conjunction with the pressure intensifying piston maintains increases in rear brake pressure proportional to but less than increases in master cylinder pressure between a first predetermined pressure and a second predetermined pressure. The pressure intensifying piston independently of the pressure reducing sleeve maintains increases in rear brake pressure



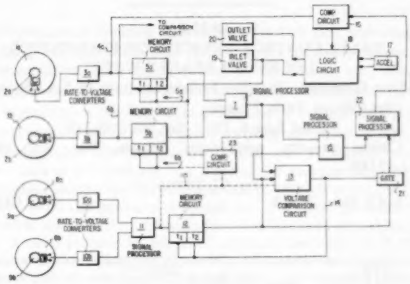
proportional to but greater than increases in master cyclinder pressure between the second predetermined pressure and a third predetermined pressure.

3,832,008

ANTI SKID CONTROL SYSTEM

Heinz Leiber, Leimen, and Anton Rodi, Karlsruhe, both of Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed Feb. 2, 1972, Ser. No. 222,780
Claims priority, application Germany, Aug. 23, 1971, 2142144
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 BE **29 Claims**

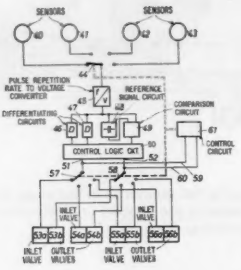


An antilocking control system in which slip signals are generated for brake pressure modulation. In this control system the circuitry for generating slip signals includes a unit for generating a signal proportional to the wheel speed and a memory circuit for generating a reference signal approximating the vehicle speed and having two different discharge time constants. When the second constant is effective, the stored signal follows decreases of the wheel speed very slowly. This constant is made effective, when a locking tendency occurs and the memory circuit is switched back to the first time constant only, if a permissible slip value is reached and particularly the re-acceleration phase is substantially completed. The slip signals are generated by comparing the reference signal from the memory circuit with the signal proportional to the wheel speed.

3,832,009
ANTISKID CONTROL SYSTEM

Heinz Leiber, Leimen, and Wolfgang Korasiak, Ketsch, both of Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed June 2, 1972, Ser. No. 259,029
Claims priority, application Germany, June 7, 1971, 2128181; Apr. 26, 1972, 2220441
Int. Cl. B60t 8/12
U.S. Cl. 303—21 P 18 Claims

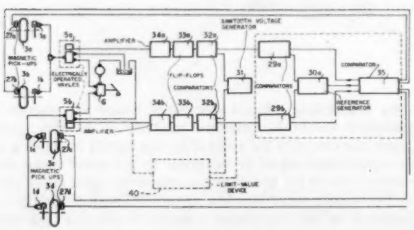


An antiskid control system for vehicles includes members for controlling the brake pressure. At least two sensors are operatively associated with different wheels of the vehicle to be braked. These sensors produce signals at their respective outputs which are respectively related to the rotational behavior of respective wheels. A circuit arrangement is coupled between the members for controlling brake pressure and the two sensors and is responsive to output signals therefrom for regulating brake pressure. The circuit arrangement includes a switching circuit and a signal evaluation channel. The switching circuit is operatively arranged to connect each of the sensors in a predetermined sequence to the signal evaluation channel. The output of which is coupled to the members for controlling brake pressure.

3,832,010
BRAKE CONTROL DEVICES FOR PREVENTING LOCKING A BRAKED WHEEL

Albert Grosseau, Chaville, France, assignor to S.A. Automobiles Citroen, Paris, France

Filed June 6, 1972, Ser. No. 260,318
Claims priority, application France, Dec. 13, 1971, 71.45188
Int. Cl. B60t 8/10
U.S. Cl. 303—21 EB 16 Claims

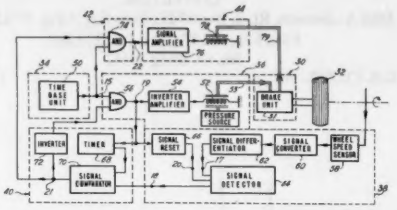


A brake control device for the wheel of a motor or other vehicle comprises an electrically operated valve incorporated in the braking circuit of the wheel. The valve is controlled by a pulsed current having a frequency or width dependent on the degree of slip of the wheel, and serves to limit the pressure of fluid in the braking circuit during such wheel slip.

3,832,011
ANTI-SLIP OR ADAPTIVE BRAKING SYSTEM

Guy Marouby, Neuilly, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Jan. 5, 1973, Ser. No. 321,494
Claims priority, application France, Dec. 29, 1971, 71.47229
Int. Cl. B60t 8/12
U.S. Cl. 303—21 P 8 Claims

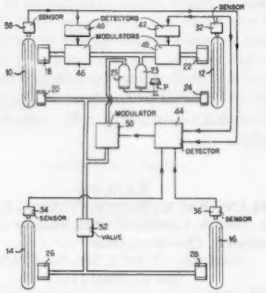


An adaptive braking system for a set of vehicle wheels, of the type comprising a fluid pressure source, braking apparatus associated with the set of wheels, and control apparatus for controlling the fluid pressure acting on the braking apparatus. The fluid pressure supplied to the braking apparatus is automatically controlled by the control apparatus in successive stages of pressure increase and pressure decrease separated from one another by intervals during which the pressure is kept constant. More particulary, a stage of pressure increase is controlled after an interval whenever the deceleration of a wheel has been decreasing or has remained constant during this interval, and a stage of pressure decrease whenever the deceleration has been increasing during the interval.

3,832,012
ANTISKID BRAKING CIRCUIT

Guy Bourgoin, Sceaux, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Jan. 12, 1973, Ser. No. 323,167
Claims priority, application France, Jan. 21, 1972, 72.2029
Int. Cl. B60t 8/00
U.S. Cl. 303—21 F 2 Claims



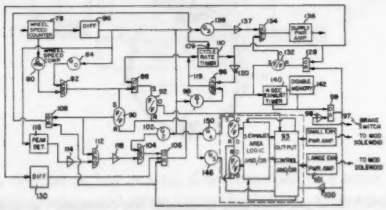
An anti-skid braking circuit for a vehicle having two independent braking circuits, a first circuit including the main brake actuators of the front wheels and a second circuit including supplementary brake actuators of the front wheels and the brake actuators of the rear wheels. Each front wheel is equipped with a speed sensor connected on one hand with an electronic anti-skid logic monitoring a fluid pressure modulator associated with the corresponding main actuator, and on

the other hand with another electronic anti-skid logic monitoring another modulator controlling the fluid pressure in the second circuit. The rear wheels of the vehicle are equipped with speed sensors also connected to the other anti-skid logic.

3,832,013
ANTI-SKID CONTROL SYSTEM FOR FLUID PRESSURE BRAKES

Dennis J. Davis, Oberlin, and John E. Juhasz, Avon, both of Ohio, assignors to The Bendix Corporation, South Bend, Ind.

Continuation of Ser. No. 76,665, Sept. 30, 1970, abandoned. This application Mar. 8, 1973, Ser. No. 338,806
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 P **5 Claims**

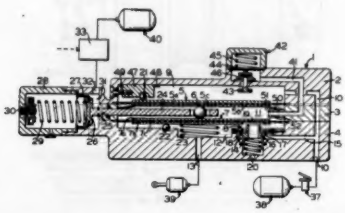


An anti-skid fluid pressure brake control system particularly designed for use under conditions of exceptionally low tire to road co-efficient of friction on the order of wet ice, apparatus being provided to relieve braking pressure upon the simultaneous occurence of low wheel speed just short of lock up and a predetermined deceleration rate and thereafter continuing pressure relief for a prolonged period of time preferably determined by the length of time it takes the wheel to reach a maximum rate of acceleration whereupon relief is terminated and pressure build up restored. Apparatus are provided for shifting to a regular adaptive mode of brake control should the vehicle encounter less severe road conditions during the brake application.

3,832,014
VARIABLE LOAD BRAKE APPARATUS

Roger Deschenes, Montfermeil, France, assignor to Wabco Westinghouse, Freinville-Sevran, France

Filed Sept. 4, 1973, Ser. No. 394,253
Int. Cl. B60t *8/18*
U.S. Cl. 303—22 R **23 Claims**



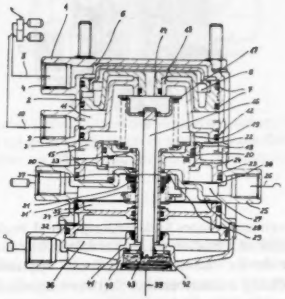
A device suitable for providing a fluid pressure as a function of two modulating factors. This device is more precisely of the type simultaneously assuring the generation of a force under the effect of an inlet pressure constituting the first factor and acting on a piston, and assuring the modulation of this force as a function of the second factor consisting of lever arms of varying length and the use of this modulated force to activate a supply and release valve device providing a pressure proportional to the value of the modulated force.

This invention is particularly applicable to an air brake equipment having a load compensating valve device that provides a brake cylinder pressure that is a function of the load on the vehicle involved.

3,832,015
CONTROL VALVE UNIT IN PNEUMATIC BRAKING SYSTEM

Siegfried Beck, Stuttgart, and Manfred Siebold, Boblingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sept. 19, 1973, Ser. No. 398,772
Claims priority, application Germany, Sept. 21, 1972, 2246242
Int. Cl. B60t *15/02*
U.S. Cl. 303—40 **11 Claims**



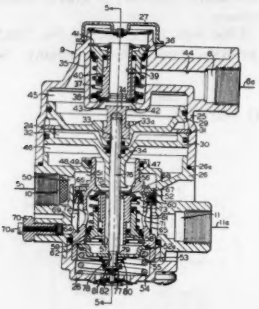
A pneumatic braking system includes two first pneumatic braking circuits of a motor vehicle and a second pneumatic braking circuit of a trailer towed by the vehicle and which second braking circuit is to be controlled in dependence upon the operation of the first braking circuits. A control valve unit provides such control and has a housing an outlet of which communicates with the second circuit, and a chamber contains fluid at the pressure of a reservoir. A valve arrangement is displaceable between a first position in which it connects the outlet with the ambient atmosphere, a second position in which it disconnects the outlet from the ambient atmosphere, and a third position in which it connects the outlet with the aforementioned chamber to thereby pressurize the second circuit. A pair of first pistons are shiftable in the housing from a normal rest position to a operated position in response to pressurization of the first circuits during braking of the vehicle. A compound second piston controls the movements of the valve arrangement, and has one piston portion connected with the valve arrangement and shiftable in the housing to thereby displace the valve arrangement sequentially from the first to the second and then toward the third position in response to movement of at least one of the first pistons to the operated position thereof. The second piston also includes another piston portion which is biased away from the one piston portion and which has a surface communicating with the interior of the outlet so that when the second circuit is partially pressurized during movement of the valve arrangement from the second towards the third position and pressure in the outlet exceeds the biasing force, the other piston portion will move into abutment with the one piston portion to thereby slow the shifting of the same and the displacement of the valve arrangement towards the third position thereof.

3,832,016

TWO PIPE TRUCK TRAILER BRAKE SYSTEM WITH MEANS FOR APPLYING FRONT AND REAR TRAILER BRAKES UPON PULL-IN-TWO

Ewald Pekrul, Am Kappenberg, Germany, assignor to Westinghouse Bremsen-und Apparatebau, GmbH, Hannover, Germany

Filed July 12, 1973, Ser. No. 378,592
Int. Cl. B60t 15/02
U.S. Cl. 303—40 6 Claims



This invention relates to a two-pipe dual brake apparatus for the trailer of a tractor-trailer vehicle in which a trailer control valve device has two coaxial and oppositely disposed pistons forming a chamber therebetween to which fluid under pressure may be supplied through one of the two pipes. These pistons operate a pair of supply and release valve mechanisms one of which controls the brakes on the rear wheels of the trailer and the other the brakes on the front wheels. A pair of storage reservoirs are provided on the trailer and charged from a compressor on the tractor. Fluid under pressure from one reservoir is supplied by one valve mechanism to operate the brakes for the front trailer wheels. Likewise, fluid under pressure from the other reservoir is supplied by the other valve mechanism to operate the brakes for the rear trailer wheels. The control valve device further comprises a third piston operable, upon the subsequent release, via a check valve, of fluid under pressure supplied thereto from the tractor, to effect operation of both valve mechanisms to thereby effect a brake application on both the front and rear wheels of the trailer.

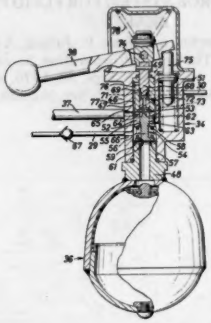
3,832,017

BRAKING SYSTEMS FOR VEHICLES

Duncan William Osborne, Leamington SpA, England, assignor to Automotive Products Limited, Leamington SpA, England

Filed Mar. 19, 1971, Ser. No. 126,126
Claims priority, application Great Britain, Mar. 20, 1970, 13496/70
Int. Cl. B60t 15/02
U.S. Cl. 303—68 2 Claims

A brake application control unit for a vehicle braking system including a source of fluid pressure at which fluid pressure is constantly available when the vehicle is in operation to supply fluid pressure for normal operation of the brakes, and means providing a constantly acting force tending to apply the same or other brakes on wheels of the vehicle, the brake application control unit including a valve which normally provides a connection between the fluid pressure source and a cylinder



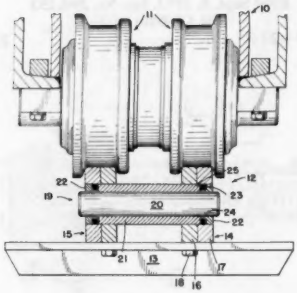
in which fluid pressure acts to oppose the constantly acting applying force and so prevent application of the brakes by said force, the valve being manually operable to allow escape of fluid from the pressure responsive device and thereby enable the brakes to be applied by the said force.

3,832,018

TRACK PIN RETAINING INSERT

David V. Nelson, and Roger L. Boggs, both of East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 27, 1973, Ser. No. 391,549
Int. Cl. B62d 55/20; F16g 13/06
U.S. Cl. 305—39 8 Claims

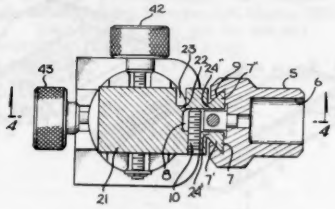


A track-type tractor comprises an endless track assembly having a plurality of shoes articulated together by a pair of laterally spaced link assemblies. Each link assembly comprises a pair of adjacent links pivotally mounted together by a pin and bushing assembly. An annular, hardened insert is press-fitted between the pin and an outboard one of the links to prevent loosening thereof during tractor operation.

3,832,019
DOVETAIL SLIDE

Vincent J. Alessi, 835 Seagull Ln., Newport Beach, Calif. 92660

Filed Apr. 7, 1972, Ser. No. 241,973
Int. Cl. F16c 21/00
U.S. Cl. 308—3 A 8 Claims

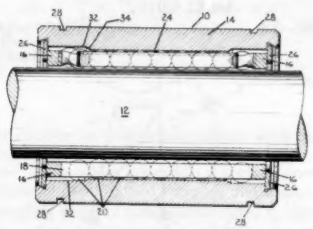


A dovetail or ball bearing slide comprised of a tenon and mating mortise, said tenon being divided into two ears by a slot. One of the ears is rendered flexible by thinning the material on one side of the slot near the root of the slot. A screw threaded through one ear of the tenon and bearing against the other ear adjusts the tenon size to exactly fit the mortise and thus allows a slide to be made with no play and any desired stiffness of fit.

3,832,020
ANTI-FRICTION BALL BEARING ASSEMBLY

Albert R. McCloskey, Fairfield, Conn., assignor to Heim Universal Corporation, Fairfield, Conn.

Filed Aug. 31, 1972, Ser. No. 285,201
Int. Cl. F16c 29/06
U.S. Cl. 308—6 C 2 Claims

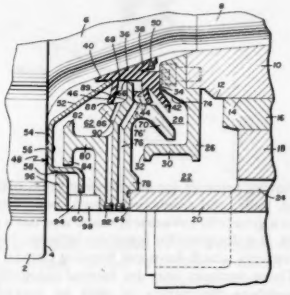


An anti-friction ball bearing assembly adapted for mounting on a shaft comprising an outer sleeve and an inner sleeve concentrically fitting within the outer sleeve, the inner sleeve having a number of tracks defining paths for the circulation of a number of plastic load carrying balls between the shaft and the bearing assembly. The plastic load carrying balls may be provided with a metallic or hardened plastic core.

3,832,021
NECK SEAL

Lewis C. Jennings, Boylston, and Samuel S. Rickley, West Boylston, both of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Filed Nov. 16, 1972, Ser. No. 307,155
Int. Cl. F16j 15/40
U.S. Cl. 308—36.1 10 Claims

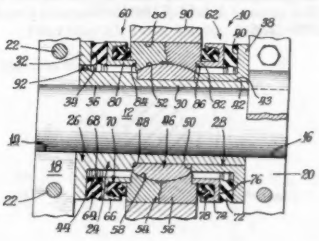


In a machine having a bearing-supported rotary element, a bearing seal for preventing each of two different fluids used in the operation of the machine from contaminating one another.

3,832,022
DUAL SEAL ARRANGEMENT FOR A SPHERICAL JOINT

Harold L. Reinsma, Dunlap, and Lowell P. Iverson, Aurora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 30, 1973, Ser. No. 355,476
Int. Cl. F16c 33/72
U.S. Cl. 308—36.1 28 Claims

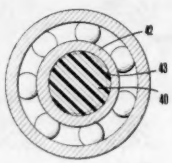


A joint includes a ball associated with a shaft and a socket body disposed thereabout. Retainer means are disposed about the shaft and define a pair of retainer surfaces spaced apart from the socket body. First annular seal means are disposed between one retainer surface and one side of the socket body, and second annular seal means are disposed between the other retainer surface and the other side of the socket body. The seal means are bonded to the respective retainer surfaces, and are in slidable sealing relation with the socket body to allow full 360° rotation of the socket body about the longitudinal axis of the shaft. The seal means also allow a degree of rotation of the socket body about axes of rotation perpendicular to the longitudinal axis of the shaft. The shaft may be associated with the retainer means so as to be relatively freely removable therefrom.

3,832,023
BALL-BEARING RETAINERS
Winthrop H. Fairbank, Sudbury, Mass., assignor to Northrop Corporation, Los Angeles, Calif.
Filed Feb. 7, 1973, Ser. No. 330,224
Int. Cl. F16c 33/38
U.S. Cl. 308—201 6 Claims

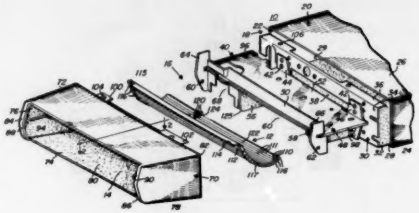
A ball-bearing retainer for suppressing gross oscillations of the retainer, balls, and raceways of high speed bearings. The retainer has a generally cylindrical shape and has a plurality of ball pockets. It is designed for insertion between two relatively rotating members which have confronting coaxial cylindrical surfaces. These surfaces may be formed integrally with the rotating members themselves or may be raceways placed between the rotating members for accommodating the balls held in the retainer. Formed upon a surface of the retainer and extending toward one or the other of the relatively rotating members is a plurality of lands or portions extending radially from the retainer. The lands are three in number symmetrically disposed about the inner or outer peripheral walls of the retainer. The centers of the lands are a nominal 120° apart and each land subtends an angle of 30° or less. Clearence between the surface of the lands and the confronting surface of one of the rotating members is typically of the order of tens of thousandths of an inch.

3,832,024
ROTATION PREVENTIVE DEVICE
Hideo Nishikawa, Sakai, Japan, assignor to Wada Seiko Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 234,083, March 13, 1972. This application Apr. 26, 1973, Ser. No. 354,884
Int. Cl. F16c 35/06
U.S. Cl. 308—236 3 Claims



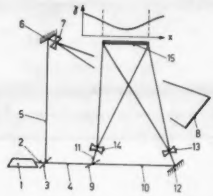
A device for securing two members, one is a metallic product and the other a plastic product, so that they can not rotate relative to each other. In one embodiment a groove which is eccentric to the axis of the metallic product is provided on the outer cylindrical surface of the metallic product and the inner cylindrical surface of the plastic product is tightly fitted to the outer cylindrical surface of the metallic product in such a manner that a part of the inner cylindrical surface of the plastic product is filled in the groove. In another embodiment a groove which is eccentric to the axis of the metallic product is provided on the inner cylindrical surface of the metallic product and the outer cylindrical surface of the plastic product is tightly fitted to the inner cylindrical surface of the metallic product in such a manner that a part of the outer cylindrical surface of the plastic product is filled in the groove.

3,832,025
CARTRIDGE TAPE PLAYER DOOR MOUNTING ASSEMBLY
Marcus M. Artner, Chicago, and Paul D. McGee, Medinah, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.
Filed Nov. 20, 1972, Ser. No. 308,085
Int. Cl. A47b 81/06
U.S. Cl. 312—297 12 Claims



A mounting arrangement for a flexible, "roll top" door member covering the cartridge receiving opening in a tape player housing includes a first, outer housing member having bottom, top and side walls with front and rear openings. Lip portions formed with the side walls at the front thereof extend in opposing relation to block off portions of the front opening. A second, inner housing member is received in the first housing member through the rear opening thereof. The second housing member includes a pair of spaced guide rail members shaped complementarily to the lip portions to form channels therebetween. The edges of the door member are captured between corresponding lip portions and guide rail members at the sides of the housing members for movement in the channels defined thereby between open and closed positions with respect to the front opening of the first housing member. A pair of descending walls on the second housing member define a cartridge passageway. One of the descending walls coacts with spaced tabs provided on the inner surface of the door member to form a track, to guide the latter when the door member is in an open position.

3,832,026
HOLOGRAPHY USING LIGHT OF LIMITED COHERENCE
Francois Mottier, Zurich, Switzerland, assignor to BBC Brown Boveri & Company, Limited, Baden, Switzerland
Filed May 11, 1972, Ser. No. 252,253
Claims priority, application Switzerland, May 14, 1971, 7180/71
Int. Cl. G02b 27/00
U.S. Cl. 350—3.5 4 Claims



A method is disclosed for forming good quality holograms using light of only limited coherence. According to the method, a hologram plate is illuminated by a reference laser beam and by laser light scattered from an object of which a hologram is to be formed. Local intensity fluctuations having maxima and minima are formed at the object for each

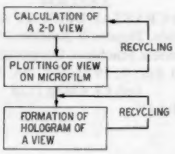
frequency of light in the laser beam. Good holograms are formed provided that the intensity maxima belonging to one frequency of the laser light do not predominantly coincide with the intensity maxima of any other frequency of the laser light.

3,832,027

SYNTHETIC HOLOGRAM GENERATION FROM A PLURALITY OF TWO-DIMENSIONAL VIEWS

Michael C. King, Basking Ridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 12, 1969, Ser. No. 806,661
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **9 Claims**



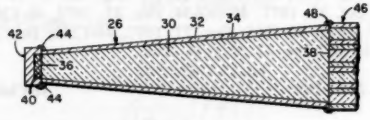
A three-dimensional computer display system is described that allows one to generate holograms of computer stored information without having to calculate the hologram. The system uses a computer to calculate and a microfilm plotter to display a multitude of two-dimensional views of a three-dimensional object stored in a computer. These views in turn are recorded sequentially to form a composite hologram comprised of many smaller holograms. While satisfactory images can be reconstructed from such a hologram simply by using a penlight in combination with a monochromatic filter, much better images can be reconstructed in white light from an image hologram formed from the composite hologram.

3,832,028

COUPLER FOR OPTICAL WAVEGUIDE LIGHT SOURCE

Felix P. Kapron, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 30, 1972, Ser. No. 239,744
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **13 Claims**



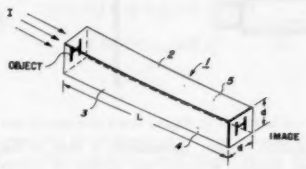
A light coupler for transferring optical wave energy to or from light transmitting means including at least one optical waveguide. The coupler comprises a tapered core of transparent material of refractive index n_1 and a layer of transparent cladding material of refractive index n_2 disposed upon the surface of the tapered core, n_1 being greater than n_2. The tapered core has a large diameter end which is aligned with an end of the light transmitting means and a small diameter end which is disposed adjacent to electro-optic energy conversion means such as a light emitting diode, a light detector or the like. When used at the transmitting end of an optical communication system, the small diameter end of the tapered core receives light from a source, and the coupler functions to collimate those light rays which enter the small diameter end and which reflect from the core-cladding interface thereof.

3,832,029

SELF-IMAGING WITH AN OPTICAL TUNNEL FOR IMAGE FORMATION

Olof Bryngdahl, Cupertino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1972, Ser. No. 298,205
Int. Cl. G02b *17/06, 27/00*
U.S. Cl. 350—96 T **18 Claims**



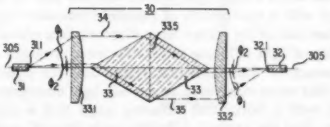
The present invention relates to the formation of images by self-imaging through the use of an optical tunnel. An optical tunnel is provided which has dimensions defined so as to satisfy a criterion for the production of self-imaging of an object located along its optical axis. The object in the preferred embodiment is located in an object plane at one end of the optical tunnel and is illuminated by means of a monochromatic light source. In the object plane, outside of the optically denser medium within the tunnel, virtual images are formed which act as virtual objects from which a self-image of the object is formed at the other end of the optical tunnel.

3,832,030

DELAY EQUALIZERS FOR MULTIMODE OPTICAL FIBERS

Detlef Christoph Gloge, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 23, 1973, Ser. No. 363,023
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **4 Claims**



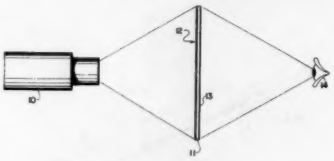
The outputs of multimode optical fibers (i.e., fibers which support the simultaneous propagation of more than a single optical mode) suffer from signal distortion due to mode delay dispersion, that is, different modes travelling through the fibers at different forward velocities.

In order to reduce this mode delay distortion in multimode optical fibers, a pair of back-to-back curvilinear conical lenses is located between two similar fibers. These lenses convert large angle modes to small angle modes, and vice versa; thereby the variation in the total delay of all modes propagating through the two fibers i.e., the mode delay dispersion, is reduced by these lenses.

3,832,031
PROJECTION SYSTEM

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 24, 1969, Ser. No. 887,996
Int. Cl. G03b 21/56
U.S. Cl. 350—117 **5 Claims**

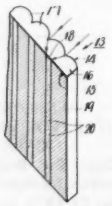


A projection system, particularly a rear, or back-lighted, projection system, wherein the screen is composed of a synthetic polymeric film, at least one surface of said film having been contacted with a solvent therefor for a time sufficient to impart translucency to said film.

3,832,032
LENTICULAR REAR PROJECTION SCREEN

Satoshi Shimada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 20, 1973, Ser. No. 352,974
Claims priority, application Japan, Apr. 25, 1972, 47-49418
Int. Cl. G03b 21/60
U.S. Cl. 350—128 **9 Claims**



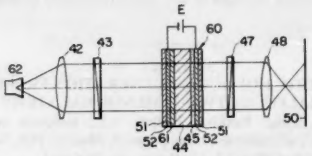
A rear projection screen in a projector which uses a cathode ray tube as an image light source has one side of the screen formed with a multiplicity of parallel lenticular ridges, while the other side of the screen has a plane surface provided with a plurality of light diffusing stripe-like areas arranged alternately thereacross. The lenticular ridges and the light diffusing stripe-like areas cooperate to provide light emerging from the screen with a horizontal diffusing angle that is controllably greater than the vertical diffusing angle thereof, and the light absorbing stripes are operative to absorb ambient light and thereby avoid deterioration of the contrast of an image projected through the screen onto the plane surface thereof.

3,832,033
REGULAR FERROELECTRICS-LIQUID CRYSTAL COMPOSITE OPTICAL ELEMENT

Yoshio Furuhata, Tokyo, and Kazuhisa Toriyama, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 18, 1972, Ser. No. 315,782
Claims priority, application Japan, Dec. 17, 1971, 46-101898
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC **17 Claims**

This invention relates to a regular ferroelectric-liquid crystal composite optical element characterized in that a film of a cholesteric liquid crystal or a nematic liquid crystal with

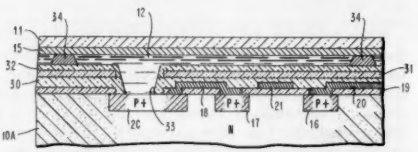


negative dielectric anisotropy is interposedly provided on the surface of a regular ferroelectric single crystal substrate.

3,832,034
LIQUID CRYSTAL DISPLAY ASSEMBLY

Harold D. Edmonds, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 6, 1973, Ser. No. 348,551
Int. Cl. G02g 1/28
U.S. Cl. 350—160 LC **45 Claims**

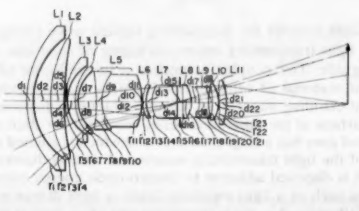


A liquid crystal cell in which one of a pair of opposed spaced electrodes is circumscribed by a dielectric shield or mask having a hue, chroma and brightness substantially the same as the color of either the circumscribed electrode or of the scattered state of the liquid crystal material disposed between the electrodes.

3,832,035
WIDE ANGLE, RETROFOCUS-TYPE PHOTO-TAKING LENS

Tomowaki Takahashi, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

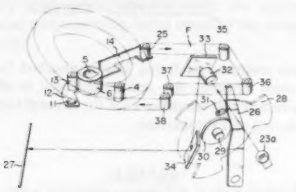
Filed Aug. 21, 1972, Ser. No. 282,172
Claims priority, application Japan, Aug. 21, 1971, 46-63366; Oct. 30, 1971, 46-86,634; Dec. 27, 1971, 46-1264; Dec. 27, 1971, 46-1265; Dec. 27, 1971, 46-1266; Dec. 27, 1971, 46-1267; Dec. 27, 1971, 46-1268
Int. Cl. G02b 9/64
U.S. Cl. 350—189 **18 Claims**



A wide angle, substantially distortion-free inverted telephoto-type photo-taking lens system comprises a forward divergent group, a forward convergent group preceding a diaphragm, and a rearward convergent group succeeding the

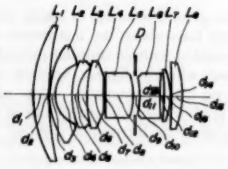
diaphragm. Any one surface in the forward divergent group may be a non-spherical surface whose non-sphericity is within a predetermined range. The lens system satisfies a predetermined condition of the center thicknesses of lenses or the air spaces between lenses.

3,832,036
FILM FEED SYSTEM FOR A CONVERTIBLE MOTION PICTURE PROJECTOR
Akira Ashida, and Tateo Yamada, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed June 28, 1973, Ser. No. 374,420
Claims priority, application Japan, July 6, 1972, 47-67814
Int. Cl. G03b *1/00*
U.S. Cl. 352—166 **5 Claims**



A motion picture projector is equipped to use both reel-to-reel film feed and endless film cartridges by providing a pivoted film guide arm in the cartridge arranged to press the film against a feed roller of the projector under control of film feed tension and arranging the projector so that the take-up reel drive for reel-to-reel operation can be converted to use as the aforesaid feed roller for endless film cartridge operation, by locking the take-up reel friction drive. This conversion may also include slipping an elastic roller over the take-up reel shaft.

3,832,037
SUPER WIDE-ANGLE LENS SYSTEMS
Jihei Nakagawa, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan
Filed Nov. 24, 1972, Ser. No. 309,597
Claims priority, application Japan, Dec. 8, 1971, 46-98616
Int. Cl. G02b *9/64*
U.S. Cl. 350—214 **2 Claims**



A super wide-angle lens system small in size and having a small F number, which is constructed as eight components and eight lenses and consists of a first component, of positive meniscus lens that has at its object side a convex surface, second and third components of negative meniscus lenses that have at their object sides convex surfaces, a fourth component of biconvex lens, a fifth of positive meniscus lens that has at its image side a convex surface, a sixth component of biconcave lens or biconcave compound lens, and seventh and eight components of positive lenses, and which system is defined by the following five conditions, i.e.

$$1.\ 0.35f < f_{23} < 0.7f, \text{ and } f_{23} < 0,$$

$$2.\ 0.2f < d_4 + d_6 < 0.5f,$$

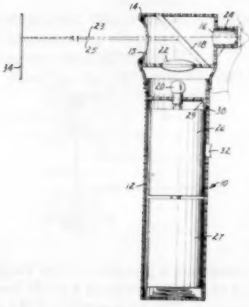
$$3.\ 0.5f < f_{45} < f,$$

$$4.\ 0.35f < d_7 + d_9 < 0.7f, \text{ and}$$

$$5.\ 0.1f < d_{V1} < 0.4f$$

where f is the composite focal length of the total lens system, f_{23} is the composite focal length of the second and third components, f_{45} is the composite focal length of the fourth and fifth components, d_4 is the air space between the second and third components, d_6 is the air space between the third and fourth components, d_7 is the axial thickness of the fourth component, d_9 is the axial thickness of the fifth component, and d_{V1} is the axial thickness of the sixth component.

3,832,038
HAND RETROVIEWER
Edgar G. Johnson, Maplewood, Minn., assignor to Minnesota Mining Manufacturing Company, St. Paul, Minn.
Filed Aug. 9, 1972, Ser. No. 278,990
Int. Cl. G02b *27/02*
U.S. Cl. 350—236 **8 Claims**

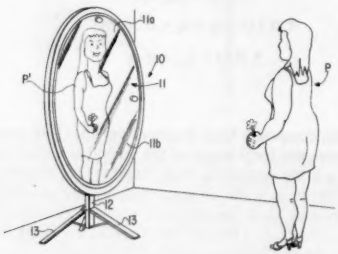


A hand retroviewer for use in verifying a document having a retro-reflective image bearing layer which is substantially transparent under ordinary diffuse light viewing conditions to provide viewing of images on an underlying surface. The viewer housing has a viewing passageway therethrough and a beam splitter having a specular reflectance of at least 60 percent is mounted in the viewing passageway. A lamp and a condensing lens which combine to produce a virtual image of the light source that has an area less than .5 square inch are positioned to transmit light to the beam splitter. Light reflected from the beam splitter is retro-reflected from the image bearing layer of a document held spaced from the viewer along the illumination axis and a portion of the retro-reflected light is transmitted through the beam splitter for viewing to verify the document by its retro-reflected image.

3,832,039
MIRROR HAVING VARIABLE CONVEX LOWER PORTION

Milton A. Doolittle, Simsbury, Conn., assignor to Select-A-Size Ltd., Syracuse, N.Y.

Filed Apr. 13, 1973, Ser. No. 351,045
Int. Cl. G02b *5/10*
U.S. Cl. 350—295 **19 Claims**

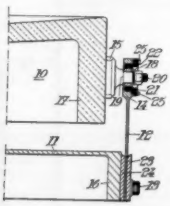


A mirror for providing an image representative of a person after a loss of weight. The upper portion of the mirror which reflects the head of a person remains planar, while the lower portion which reflects the body is variably curved. The mirror is provided with an adjustable support so that the planar upper portion may be moved vertically to accommodate persons of different heights.

3,832,040
FIXING DEVICE FOR A COMPONENT OF A SYSTEM

Jacques Paul Elie Ciabrini, Chatenay Malabry, France, assignor to Engins Matra, Paris, France

Filed Mar. 15, 1973, Ser. No. 341,328
Claims priority, application France, Apr. 14, 1972, 72.1331
Int. Cl. G02b *5/08*
U.S. Cl. 350—310 **8 Claims**



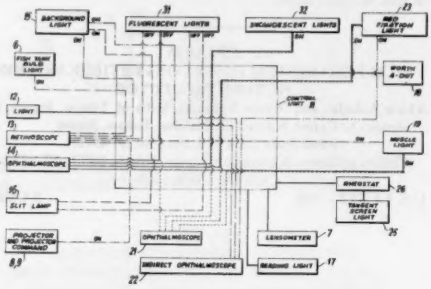
The device comprises a plurality of thin elastic strips distributed at equal angular intervals on a circle centered on the axis of the component. The large surface of the strips is positioned in the plane tangential to the circle parallel to the axis of the component, each of said strips having a tightly securing connection to the support (or the component) and a universal connection to the component (or the support). The device is particularly useful for fixing a component of an optical system in a satellite.

3,832,041
OPHTHALMOLOGICAL APPARATUS FOR USE IN AN EXAMINING ROOM

David M. Lieberman, 174 8th Ave., Brooklyn, N.Y. 11215

Filed Dec. 3, 1971, Ser. No. 204,468
Int. Cl. A61b *3/00, 3/10;* **H05b** *37/00*
U.S. Cl. 351—1 **10 Claims**

A system for use by an ophthalmologist for the examination of a patient basically comprises a plurality of environmental devices such as lights, fixation devices, and the like, in combination with the various ophthalmological instruments employed by the ophthalmologist, all of said environmental

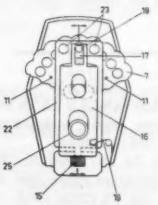


devices and instruments being interconnected to a central control system whereby the ophthalmologist is afforded optimum environmental conditions for the several tests which he conducts during an examination.

3,832,042
INTERNAL READING DEVICE FOR OPHTHALMOLOGICAL INSTRUMENTS

Helmut A. Heine, Herrsching/Upper Barrenia, Germany, assignor to Propper Manufacturing Co., Inc., Long Island City, N.Y. and Optotechnik Heine KG, Herrseching, Germany, part interest to each

Filed Nov. 20, 1972, Ser. No. 308,254
Int. Cl. A61b *3/12;* **G02b** *27/34, 5/14*
U.S. Cl. 351—6 **5 Claims**



An ophthalmological instrument in which selected parameters of the optical function of the instrument may be varied during use is provided with an internal optical system under control of the user whereby figures, symbols, scales or other indicia identifying the momentary value of the variable parameters are rendered visible to the user in the instrument viewing aperture while the instrument is in use.

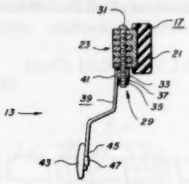
3,832,043
SPECTACLES POSITIONING APPARATUS

Michael D. Usdan, 3771 N. Swan Ridge Cir., Memphis, Tenn. 38122

Filed Apr. 26, 1973, Ser. No. 354,647
Int. Cl. G02c *5/14*
U.S. Cl. 351—123 **1 Claim**

Apparatus for positioning standard spectacles so that no portion of the spectacles contacts the nose or adjoining facial tissue of the person wearing the spectacles. A pair of support pads formed of flexible, resilient plastic are positioned ad-

jacent the malar-bones of the person wearing the spectacles and are mounted to each of the hinge members of the spectacles thereby holding the frame front of the spectacles away from the nose and adjoining facial tissue of the person wearing the spectacles.

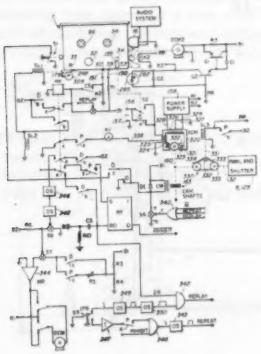


3,832,044

FILM LOOP CONTROL SYSTEM FOR SOUND MOTION PICTURES

Robert H. Deeran, Derry, N.H., assignor to Poloroid Corporation, Cambridge, Mass.

Filed June 28, 1973, Ser. No. 374,637
Int. Cl. G03b *31/00*
U.S. Cl. 352—14 **10 Claims**



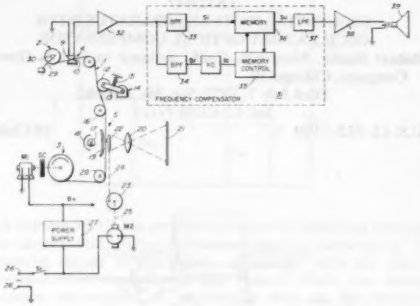
A film transport control system for a sound motion picture production and sound editing system, comprising a combined motor and transformer which serves to supply power to the apparatus, including power for the projection lamp, to drive a program control shaft that controls operation of the system for photographic processing, projection and rewinding operations, and to drive an incremental film advance pawl. A DC motor drives a capstan, to move the film at uniform speed past a transducer head, under the control of a photocell illuminated at times by a loop formed in the film between the sound head and the projection drive pawl driven by the combined motor and transformer. The photocell controls the motor through a two stage amplifier comprising two filtering capacitors to provide a long time constant control over the average speed of the capstan to reduce wow and flutter.

3,832,045

WIDEBAND FREQUENCY COMPENSATION SYSTEM IN A SOUND MOTION PICTURE PROJECTOR

Stewart W. Wilson, 30 Lang St., Concord, Mass. 01742, and Edwin K. Shenk, 24 Edsel Rd., Littleton, Mass. 01460

Continuation of Ser. No. 294,488, Oct. 2, 1972. This application Oct. 1, 1973, Ser. No. 401,988
Int. Cl. G03b *31/02*
U.S. Cl. 352—25 **18 Claims**



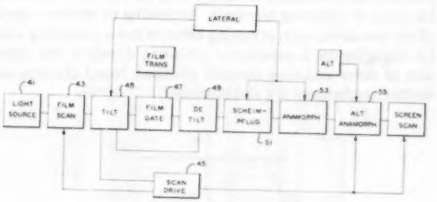
A frequency deviation compensation system in which an information signal is recorded on a record medium simultaneously with a pilot reference signal. A reproducing system is provided in which samples of the recorded information are read from the record into a storage register at a rate determined by the reproduced pilot signal, and read out of the storage register at a fixed rate to compensate for differences in the speeds at which the information is stored on, and retrieved from, the record.

3,832,046

PANORAMIC PROJECTOR AND CAMERA

Richard A. Mecklenborg, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Nov. 13, 1972, Ser. No. 305,792
Int. Cl. G03b *37/00*
U.S. Cl. 352—69 **49 Claims**



A panoramic motion picture projector useful in flight simulators and in the entertainment field is shown. A curved cylindrical segment of film which typically subtends 180° at the film gate contains a full 360° of picture information thus enabling projection of a complete panoramic image. The film segment is scanned by a slit of light revolving about the axis of curvature of the segment and the resulting image is converted to a rotating radial pattern having said axis as its center. In one embodiment, the speed of rotation of the radial pattern is increased to cause an input rotation of 180° to cover 360°, and the pattern is then restored to the cylindrical format by a scanning projection head for projection on a cylindrical

screen. For use in situations, e.g., in flight simulators, where perspective transformations are required, means are provided to tilt the scanning slit in order to pick up the required image information and then to detilt it afterwards. Translation corrections are then obtained by Scheimpflug and anamorphic correction means and placed in the optical path prior to projection. A panoramic camera is also described.

3,832,047

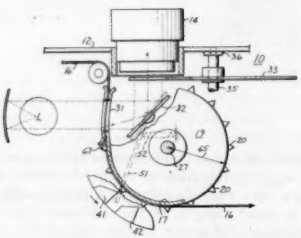
SEQUENTIAL PICTURE APPARATUS WITH OSCILLATORY OPTICAL COMPENSATOR

Robert Haake, Monrovia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed July 7, 1972, Ser. No. 269,682

Int. Cl. G03b *41/10*

U.S. Cl. 352—109 **18 Claims**



A sequential picture apparatus, such as a motion picture camera, projector, viewer or scanner, or a microfilm reader, employs a continuously moving film and an oscillatory optical compensator device for compensating the continuous film motion. The optical compensator is oscillated with the aid of a rotating circular array of actuating elements as well as a mechanism or device, such as an arm, for translating rotary motion of the actuating elements into oscillatory motion of the compensator device. The optical compensator is mounted for oscillatory motion at a location spaced by a predetermined distance from an axis about which the actuating elements are rotated. In accordance with one aspect of this invention, this predetermined distance is smaller than the radius of the circular array of actuating elements. According to another aspect of the invention, each actuating element has a projecting edge for engaging the compensator actuating device to the exclusion of other actuating element portions. Novel shutters and shutter mechanisms are also disclosed.

3,832,048

PROCESSING COMPOSITION RELEASE MECHANISM FOR FILM CASSETTE COMPRISING SELF-CONTAINED FILM PROCESSING SYSTEM

John F. Batter, Jr., Lincoln; Paul B. Mason, Magnolia; Joseph A. Stella, West Peabody; Paul W. Thomas, Jr., Duxbury, and Joseph H. Wright, Peabody, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 227,092, Feb. 17, 1972, Pat. No. 3,785,725. This application July 31, 1973, Ser. No. 384,217

Int. Cl. G03c *1/00*

U.S. Cl. 352—130 **1 Claim**

Apparatus for controlling the release of processing composition in a film cassette comprising a roll of film and containing a film processing system. A container of film processing composition within the cassette is initially sealed by a tear strip that is pulled away, to release the composition for coating on the film, by an arm initially held in an inactive position. The arm is moved to a position adapted to engage a cam formed on a spool about which the film is coiled. The cam

engages the arm to detach the tear-tab and release the processing composition when the spool is rotated in a predetermined sense.

3,832,049

SLIDE TRANSPARENCY PROJECTING AND SIMULTANEOUS SOUND REPRODUCING DEVICE

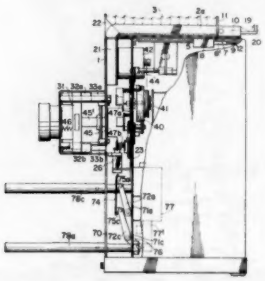
Shinichi Sato, No. 33-10, Miyasaka 3-chome,, Setagaya-ku, Tokyo, Japan

Filed Dec. 28, 1971, Ser. No. 213,012

Claims priority, application Japan, Dec. 31, 1970, 45-126045

Int. Cl. G03b *31/06*

U.S. Cl. 353—19 **4 Claims**



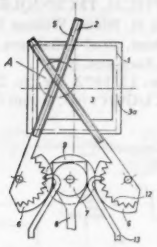
A slide transparency projecting and simultaneous sound reproducing device adapted to sequentially project a plurality of slide transparencies each incorporated in a tape cassette is provided, and simultaneously with projection, the sound reproduction is effected.

Such tape cassettes each incorporating a slide transparency are sequentially and automatically fed to a projection and sound reproduction position in a device consisting of, say, a combination of a slide transparency projector and a sound reproducing device (for example, a cassette tape recorder). Accordingly, one can watch the projected screen and at the same time can listen to the text of the illustration being projected. This device provides a useful combination of a slide transparency projector and sound device which have remained desirable hitherto.

3,832,050
INDICATING MECHANISM FOR A PROJECTION APPARATUS

Hans Werner Johannsen, Eichenau, Germany, assignor to Braum A.G., Frankfurt, Germany

Filed Feb. 7, 1972, Ser. No. 224,030
Claims priority, application Germany, Feb. 12, 1971, 2106602
Int. Cl. G03b *11/02, 21/26*
U.S. Cl. 353—42 11 Claims

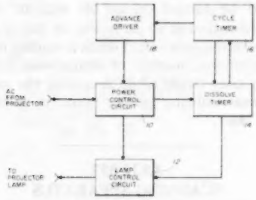


In a picture projection apparatus operable with an objective and an optical arrangement placed along an optical axis for projecting a picture placed between the objective and the optical arrangement the provision of an indicating mechanism including a pair of elongated flat indicating bars of a transparent material extending into the path of the light in a plane between the picture plane and the objective, the indicating mechanism including a drive arrangement for operating the indicating bars by causing each of the indicating bars to sweep the entire picture window area and for bringing the indicating devices to an intersection at any position over the picture area, the indicating bars carrrying a thin strip of less transparent material which during the intersection creates a darker field over the picture detail on the screen without covering such detail.

3,832,051
PROJECTOR DISSOLVE CONTROL

Allen K. Swanson, Walpole, Mass., assignor to Hamton Engineering Associates, Inc., Norwood, Mass.

Filed Oct. 16, 1972, Ser. No. 297,948
Int. Cl. G03b *23/16*
U.S. Cl. 353—86 20 Claims

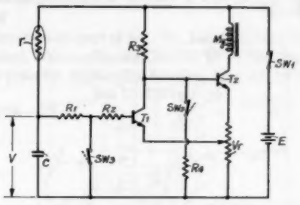


An adapter for insertion into the remote function receptacle of a conventional slide projector to receive operating power therefrom and for providing a gradual fading in and out of the picture displayed by each slide. The adapter includes one timing circuit for providing automatic slide advancement having adjustable means for controlling the time interval between slides, and another timing circuit for controlling the rate at which the fading in and out, or dissolve, of the picture takes place.

3,832,052
ELECTROMAGNET DRIVING SWITCH ARRANGEMENT FOR ELECTRONIC CAMERA SHUTTERS

Koichiro Watanabe, Funabashi, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed May 8, 1973, Ser. No. 358,265
Claims priority, application Japan, May 15, 1972, 47-55570
Int. Cl. G03b *7/08*
U.S. Cl. 354—51 7 Claims

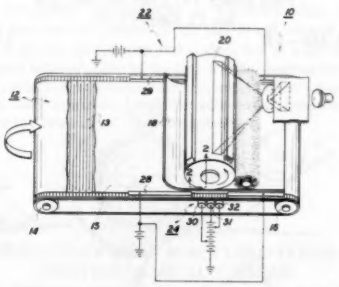


A camera which has an electromagnet for initiating closing of a camera shutter when the electromagnet is deenergized. A switching circuit is electrically connected with the electromagnet for determining the instant when the latter becomes deenergized in accordance with an information signal received by the switching circuit. A control circuit is electrically connected with the switching circuit for placing the latter in a condition which prevents energizing of the electromagnet as long as a switch of the control circuit remains closed. It is only upon opening of this latter switch that it becomes possible for the electromagnet to become energized. This latter switch is opened after initiation of the shutter opening operation and just prior to the opening of the shutter, whereby the electromagnet will remain deenergized during light measurement and other preparatory operations and will only be energized just prior to the opening of the shutter.

3,832,053
BELT TRANSFER SYSTEM

Narendra S. Goel, Henrietta, and Gerald M. Fletcher, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1973, Ser. No. 421,177
Int. Cl. G03g *15/14*
U.S. Cl. 355—3 R 12 Claims



An electrostatographic copying system in which an image is formed on an imaging surface and transferred at a transfer station to a copy sheet, where the copy sheet is transported through the transfer station on a belt which has a pattern of very closely spaced discrete conductive strips which are electrically biased to provide a pattern of electrostatic fringe fields

holding the sheet onto the belt. The same conductors may be variably biased in the transfer station to effect tailored transfer fields.

3,832,054

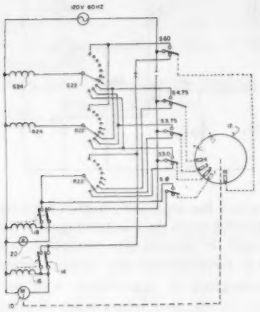
PHOTOGRAPHIC PRINT TIMER

Arthur J. Sable, Boulder, Colo., assignor to Sable Photo Works, Inc., Boulder, Colo.

Filed June 6, 1973, Ser. No. 367,487

Int. Cl. G03b *27/76*

U.S. Cl. 355—35 **9 Claims**



This invention relates to a multiple-event timer that presents the user with a limited number of preselected time interval choices for two or more related events which bear a precise and known relationship to one another such that the effect of a change in the time interval for one such event has a predictable effect on its relationship to the companion events. More particularly, the instant invention relates to a timer specifically suited for use in timing the three primary color exposures of a color print being made by the tri-color printing method wherein the several available discrete time intervals presented to the user are preselected and separated from one another by the same equal fraction of a photographic stop.

3,832,055

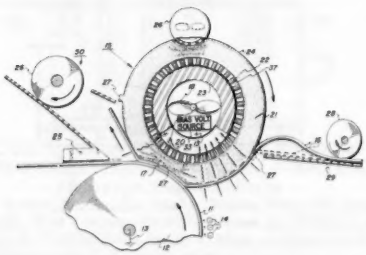
FORAMINOUS VACUUM BIAS ROLL TRANSFER SYSTEM

Ralph A. Hamaker, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed June 5, 1973, Ser. No. 367,279

Int. Cl. G03g *15/16*

U.S. Cl. 355—3 R **17 Claims**



In electrostatographic apparatus for applying a high bias voltage between a bias roller electrode and an original support surface to provide an electrical field for development material transfer to a cut sheet therebetween without arcing or undesired corona, a roller electrode having an electrically conductive core to which said high voltage is applied and a normally thick roller body of foraminous convolute open cell material compressed between the conductive core and the support surface and a vacuum applied through said foraminous material to hold said cut sheet against said roller electrode.

3,832,056

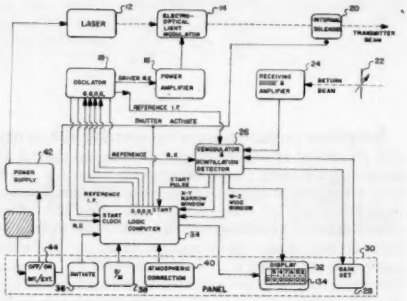
DISTANCE MEASURING DEVICE USING ELECTRO-OPTICAL TECHNIQUES

John I. Shipp; Robin H. Hines; William L. Hollinshead, and Thomas D. Broadbent, all of Tullahoma, Tenn., assignors to AGA Corporation, Secaucus, N.J.

Filed Mar. 13, 1972, Ser. No. 234,018

Int. Cl. G01c *3/08*; **G06m** *7/00*

U.S. Cl. 356—5 **19 Claims**



An electro-optical surveying instrument for measuring distance utilizing a frequency modulated laser beam is provided with special positioning of lenses so that there is an internal calibration for the lenses utilized so that an exact measurement can be made of a distance from the plumb point of the instrument to the retroreflector at the point from which the distance is being measured. A digital signal level indicator is provided to give the operator of the instrument an exact indication of the strength of the return beam so that he knows exactly whether a reading can be made under a given condition. Electronic logic is provided within the instrument to cancel all second harmonic distortions. The surveying instrument itself is provided with a photo optical switch which allows the instrument to be turned on or off without the need for touching the instrument so as not to in any way affect the exact position of the instrument when a reading is being made. Further, a minimum number of frequencies are utilized to modulate the laser beam while receiving the same range as with instruments utilizing greater numbers of frequencies to modulate the laser.

3,832,057

SCANNING APPARATUS

David K. Shogren, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

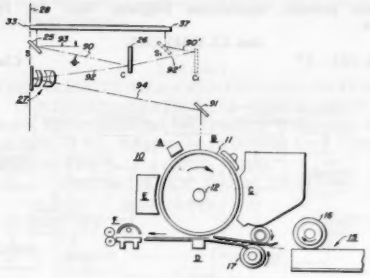
Filed June 2, 1972, Ser. No. 259,181

Int. Cl. G03g *15/04*

U.S. Cl. 355—8 **14 Claims**

Apparatus is herein disclosed for compressing the optics of a scanning system for producing a flowing light image of a stationary original. A scanning mirror is arranged to sweep past the stationary original at a predetermined rate to create a series of incremental images thereof. A stationary half lens is positioned below the scanning mirror in the start of scan posi-

tion and is arranged to redirect received light back in the direction of scan. A second compensating mirror is moved in



cooperation with the scanning mirror which continually redirects the reflected light rays from the scanning mirror back to the lens along the lens receiving optical axis.

3,832,058

PROCESS AND APPARATUS FOR SETTING A REPRODUCTION CAMERA

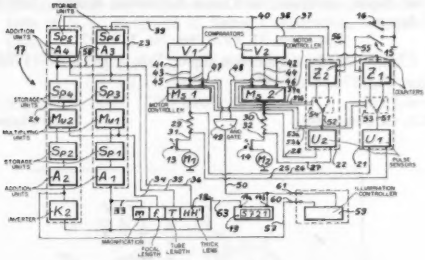
Eckart Gusovius, Auwiese, Germany, assignor to Thefiem "Dr. Boger Diplomat Apparate KG", Holstein, Germany

Filed Mar. 26, 1973, Ser. No. 344,882

Claims priority, application Germany, May 25, 1972, 2225416

Int. Cl. G03b *3/10, 27/34*

U.S. Cl. 355—56 **21 Claims**



A reproduction camera has a carrier for a replaceable objective lens and a carrier for the image plane, both carriers being movable to different distances from a copy holder by electric motors, and an electronic digital computer, which determines the actual distances of the carriers from the holder by counting electrical pulses generated upon incremental movements of the carriers (as by pole passages of the motors, or directly); the desired distances for sharp focus, corrected for T (distance of the objective lens from the objective carrier) and HH' (distance between principal focal points) are computed on the basis of the desired magnification and the focal length of the selected lens, and are compared with the actual distances; and the motors are controlled as the results of the comparisons of the actual and the desired distances.

3,832,059

FLOW VELOCITY MEASURING ARRANGEMENT UTILIZING LASER DOPPLER PROBE

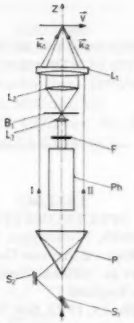
Paul Dominik Iten, Oberrohrdorf, Switzerland, assignor to BBC Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Continuation-in-part of Ser. No. 146,162, May 24, 1971, abandoned. This application June 5, 1973, Ser. No. 367,148

Claims priority, application Sweden, May 29, 1970, 8047/70

Int. Cl. G01p *3/36*

U.S. Cl. 356—28 **5 Claims**



Apparatus for measuring the velocity in fields of flow by means of a self-adjusting laser-doppler probe serving to receive back-scattered signals which includes a single lens which functions both as a transmission and also as a receiving lens. Two coherent laser beams, obtained from a single primary laser beam are fed to this lens symmetrically and parallel to the optical axis of the lens at an axial distance which is smaller than the lens radius and the back-scattering measuring point lies in the focus of the lens and thus in the meeting point of the two beams having different directions after refraction by the lens. The back-scattered light containing the two doppler-shifted frequency components is focussed after passing through the lens by means of an additional optical system coaxial with the optical axis and is then fed to a detector for mixing and heterodyning of the two doppler-shifted frequency components thus to produce an electrical signal which is dependent only upon the doppler differential frequency and hence on the velocity of scattering particles.

3,832,060

METHOD OF PREPARING ANALYTE MATERIAL FOR SPECTROCHEMICAL ANALYSIS

Ralph L. Dahlquist, Santa Barbara, Calif., assignor to Applied Research Laboratories, Inc., Sunland, Calif.

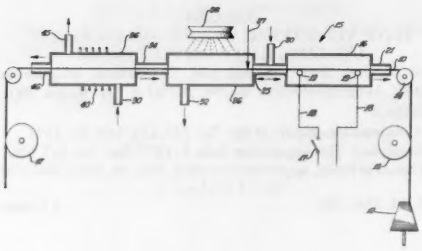
Filed Aug. 10, 1972, Ser. No. 279,619

Int. Cl. G01n *1/00*

U.S. Cl. 356—36 **12 Claims**

An analyte material is prepared for spectrochemical analysis by depositing it in solution or electrostatically precipitating it upon a previously purged yarn of finely divided carbon fibers, dessicating it in situ, and electrically heating the yarn

sufficiently to vaporize the analyte material while passing a gas stream over it in which the analyte material is condensed in



particles of sufficiently small size to form an aerosol which is then conducted to any of a variety of excitation sources for spectrochemical analysis.

3,832,061

SPECTROMETERS

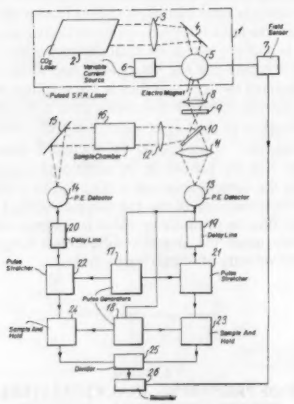
Stanley Desmond Smith, Midlothian; Roland Andrew Wood, Edinburgh, and Richard Benson Dennis, Midlothian, all of Scotland, assignors to National Research Development Corporation, London, England

Filed Feb. 13, 1973, Ser. No. 332,222

Claims priority, application Great Britain, Feb. 18, 1972, 7616/72

Int. Cl. G01j *3/42*

U.S. Cl. 356—88 **2 Claims**



In a spectrometer using a tunable pulsed spin-flip Raman laser as the radiation source, the output of the laser is split into sample and reference beams which are arranged to fall on separate detectors. The ratio of the outputs of the two detectors is computed for each pulse from the laser by means of an electronic system triggered by pulses derived from one of the detectors.

3,832,062

SPECTROPHOTOMETRICAL APPARATUS FOR DETERMINING DOSING SUBSTANCES IN A LIQUID

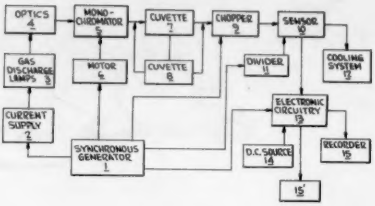
Francois J. G. Van Den Bosch, 11 Hillcrest Rd., Cedar Grove, N.J. 07009

Filed Mar. 27, 1973, Ser. No. 345,354

Claims priority, application Belgium, Mar. 29, 1972, 115738

Int. Cl. G01j *3/42*

U.S. Cl. 356—97 **7 Claims**



Spectrophotometric apparatus for determining substances present in a liquid by a visual indication or display of the differences between a spectrum of the liquid and a standard liquid. A spectrum of the liquid and a reference liquid is analyzed by scanning the band-width of luminous radiation from the ultraviolet to the near infra-red. The spectra are alternatively chopped and compared with a reference voltage. The output representing the difference between the spectra is obtained from an operational amplifier having a feedback circuit including a light generating element for generating a light output proportional to the difference between the spectral and a light sensitive element responsive to the light output of the light generating means. Alternatively the apparatus may be used to compare a previously made recording with a standard recording so that the differences therebetween can be displayed for immediate analysis as an aid in the diagnoses of blood, etc.

3,832,063

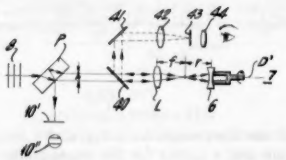
LENS AXIS DETECTION USING AN INTERFEROMETER

Kazuya Matsumoto, Yokohama, and Mikichi Ban, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1973, Ser. No. 328,297

Claims priority, application Japan, Feb. 1, 1972, 47-11706; Apr. 14, 1972, 47-37455

Int. Cl. G01b *9/02*

U.S. Cl. 356—109 **10 Claims**

In the detection of the position of the axis of a lens, a coherent beam of light is divided, by a beam splitter, into two beams which are bent to intersect at a line and in the paths of which is positioned the lens to be examined at a location such that the center of curvature of a front surface coincides with the point of intersection of the two beams so that the two beams illuminate two portions on the curved surface of the lens. The two coherent beams strike the curved surface per-

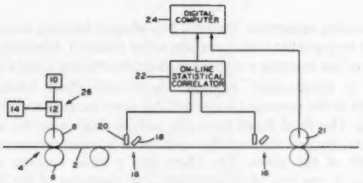
pendicularly, after which they are returned along the same paths to the beam splitter and are superimposed thereby, at a line, to produce a pattern of interference fringes. During the detection, an axis of rotation, about which the lens to be examined is rotated, is selected so as to satisfy the condition that the pattern of interference fringes does not vary with rotation of the lens. When this condition is obtained, the position of the lens axis is determined.

3,832,064

PATTERN LENGTH MEASUREMENT AND CONTROL BY CONTINUOUS-STATISTICAL-CORRELATION

Robert L. Horst, Lancaster, and Dennis L. Wolgemuth, Mount Joy, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 29, 1972, Ser. No. 319,777
Int. Cl. G01b *11/00*
U.S. Cl. 356—163 **7 Claims**



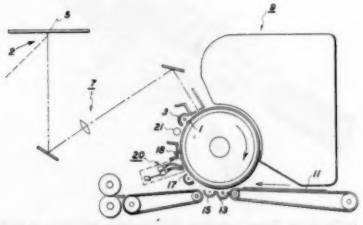
An apparatus and a method are provided for measuring repeat length of a repeated design pattern on goods as an inspection technique and quality control system. A pair of photoelectric scanner sensors are positioned apart a distance which is a multiple of the basic pattern repeat length. The output from the scanner sensors is correlated, and a signal is provided which gives an indication of the time shift between the scanned signatures of the repeat pattern which is picked up by the scanner sensors. This value of the time shift is then used with the speed of the goods in on-line calculations to determine the repeat length and/or to control repeat length.

3,832,065

DRUM TRACK DETECTOR

Bernard J. Sullivan, Webster, and David G. Baxter, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 23, 1973, Ser. No. 344,322
Int. Cl. G01n *21/48, 21/16*
U.S. Cl. 356—210 **32 Claims**



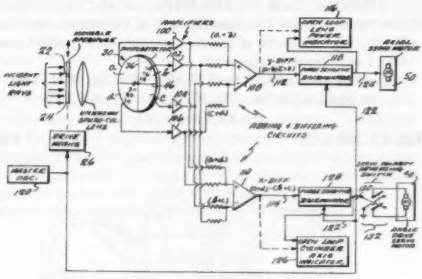
A method of and an apparatus for detecting a medium includes means or steps for providing a light beam and means or steps for detecting the light after it is reflected from the medium. The light providing means is positioned to direct a light beam onto a substantially planar surface at a predetermined angle of incidence. The presence of a sheet medium that may be laid on the planar surface is detected by detecting a portion of the light reflected by the sheet medium. Preferably, the detecting means is positioned so that it senses a portion of light scattered or diffused by the paper but is positioned outside of the path of the reflected light from the planar surface so that it does not detect the reflected light. In this manner, the apparatus is rendered to be capable of detecting the presence of sheet medium that diffuses the light but avoid detecting the reflected light from a planar surface. The ability to discriminate is enhanced by pulsing the light at a given repetition rate and by providing an amplifying arrangement in the photodetecting means that is tuned to the repetitive rate of the pulsed light. The discrimination capability is further enhanced by choosing a light beam that has an energy spectrum which is substantially transparent to the planar surface, i.e., is substantially absorbed by the planar surface but which is non-transparent to the sheet medium; i.e., is bounced back and diffused substantially by the sheet medium.

3,832,066

APPARATUS AND METHOD FOR ANALYZING SPHERO-CYLINDRICAL OPTICAL SYSTEMS

Tom N. Cornsweet, Washington, D.C., assignor to Acuity Systems, Incorporated, McLean, Va.

Filed Oct. 27, 1972, Ser. No. 301,366
Int. Cl. G01h *9/00*
U.S. Cl. 356—127 **24 Claims**



An apparent line source of collimated light is projected through a sphero-cylindrical lens under test onto a quadrant photodetector and is then relatively rotated in the plane of the detector to provide substantial alignment of the line source with one of the parting axes of said detector to define and orient the cylindrical axis of said lens. Subsequent movement of the detector along the optical axis of the system defined by the line source, the lens under test and the intersection of the parting axes of the detector provides a phase reversal or other null point of the signal generated in said detector as it moves through the focus of the lens. The position of the focus thus provides the power of the lens.

3,832,067

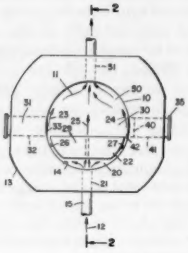
COLORIMETER FOR DETECTING BLOOD LEAKS IN AN ARTIFICIAL KIDNEY MACHINE

J. David Kopf, Tujunga; Cole D. Bacon, Encino, and Teryl W. Schwartz, Tujunga, all of Calif., assignors to David Kopf Systems, Tujunga, Calif.

Filed Nov. 24, 1972, Ser. No. 309,152
Int. Cl. G01j *3/50*
U.S. Cl. 356—181 **6 Claims**

A colorimeter is provided that senses the presence of a contaminant opaque to light of a specific color which is carried in a fluid flowstream. As the flowstream passes through the

colorimeter, a photocell on one side of the flowstream is illuminated only by light of the specific color which originates on



the opposite side of the flowstream, the photocell sensing a change in intensity of transmitted light caused by presence of the contaminant.

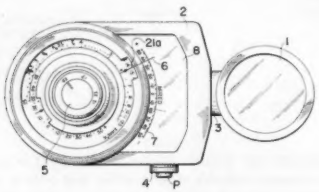
ERRATUM

For Class 356—209 see:
Patent No. 3,832,070

3,832,068
THREE COLOR METER WITH A CALCULATOR

Mikio Naya; Haruki Yamaguchi, both of Toyokawa, and Izumi Horie, Toyohashi, all of Japan, assignors to Minolta Camera Co., Ltd., Osaka-fu, Japan

Continuation of Ser. No. 117,893, Feb. 23, 1971. This application Nov. 20, 1972, Ser. No. 307,829
Int. Cl. G01j 1/42
U.S. Cl. 356—173 **1 Claim**

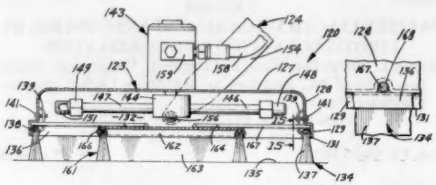


A three color meter with a calculator in accordance with the present invention is so constructed that the whole measuring range of a color meter is divided into a plurality of divisional measuring ranges; and a pointer and a scale graduated at equal intervals with the mired unit and common to every range are provided; and an indicating means for indicating the color temperature value as deviation for the central value of every range shown by the mired unit and the R·G index, first and second scale disks corresponding thereto, a manual operation member for the division setting member, and a transparent scale disk concentric with said first and second scale disks are equipped; the linear relation between the color temperature value of said indicating means and the logarithm of the spectral energy ratio is arranged to be held by compensating an electrical circuitry; and further in measuring R·G spectral energy ratio it is possible to obtain in high precision the color temperature conversion filter coefficient and the green wave length compensation filter coefficient for an illumination source suitable for a photosensitive material to be used in color photographing by artificial illumination, making use of the approximation based on the Wien formula.

3,832,069
CLEANING APPARATUS

Harold A. Petsch, Excelsior, Minn., assignor to Chaska Chemical Company, Inc., Savage, Minn.

Continuation-in-part of Ser. No. 222,836, Feb. 2, 1972. This application Nov. 16, 1972, Ser. No. 307,043
Int. Cl. A47l 13/10
U.S. Cl. 401—289 **12 Claims**

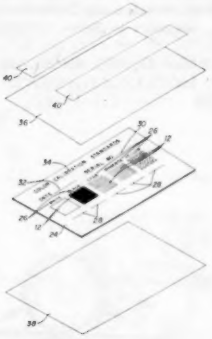


A cleaning apparatus having a pan-shaped housing carrying brushes engageable with a surface to be cleaned. Mounted on the top of the housing is a spinner assembly having a body containing a longitudinal passage. A tubular shaft rotatably mounted in the passage carries tubular arms located within the housing. The fluid flows from the hollow shaft into the arms and is discharged through the orifices in nozzles mounted on the ends of the arms. The shaft has a head located in a chamber at one end of the passage. The diameter of the head is larger than the diameter of the passage and is dynamically balanced by the flow of fluid under pressure through the passage and chamber into the hollow shaft. A guard carrying a center brush attached to the housing protects the arms and nozzles of the spinner assembly.

3,832,070
CALIBRATION SYSTEM FOR REFLECTION DENSITOMETERS

James R. Cox, Richardson, Tex., assignor to Cosar Corporation, Garland, Tex.

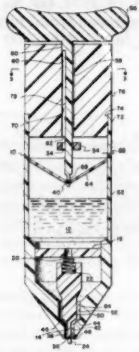
Filed Apr. 27, 1973, Ser. No. 355,023
Int. Cl. G01n 21/48
U.S. Cl. 356—209 **18 Claims**



In a reflection densitometer calibration system, a calibration standard comprises a paper sheet having color zones printed thereon, including the colors white, black, and shades of blue, red and yellow. The paper sheet is laminated between two transparent plastic sheets which enclose the paper sheet and form a protective covering over the color zones. Strips of a transparent writing accepting material are then secured to the outer surface of the plastic layer which overlies the color zones.

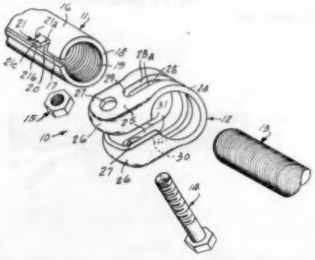
After the calibration standard is fabricated, the optical densities of the color zones are determined by means of a master reflection densitometer. An indication of the optical density of each color zone is then written on the portion of the writing accepting strip adjacent the color zone. The calibration standard is then ready for use in calibrating reflection densitometers.

3,832,071
DISPENSER FOR ERROR CORRECTING FLUIDS
Preston E. Chaney, 6144 Waggoner Dr., Dallas, Tex. 75230
Filed Mar. 21, 1973, Ser. No. 343,370
Int. Cl. B43k *1/06*
U.S. Cl. 401—260 **10 Claims**



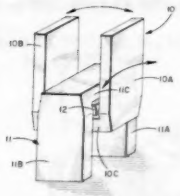
A pigmented volatile fluid dispenser having a chamber for holding the fluid which has a valve dispensing end and a vent for equalizing the pressure between the chamber interior and the dispenser environment.

3,832,072
CLAMP ASSEMBLY
Sylvester Stanislaus Mazur, Detroit, Mich., assignor to TRW Inc., Cleveland, Ohio
Filed Apr. 23, 1973, Ser. No. 353,906
Int. Cl. F16b *7/06*
U.S. Cl. 403—46 **12 Claims**



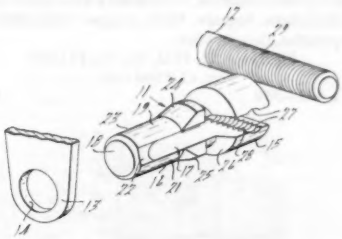
The location of a draw bolt clamp on an adjusting sleeve assembly for tie rods of automotive steering linkages is controlled by a tab on the slotted tube of the assembly projecting into a slot in the clamp to hold the clamp against axial shifting on the tube and to prevent rotation of the loose clamp to a position where any portion of the clamp could enter the tube slot when the clamp is tightened on the tube. The assembly may be in the form of an internally threaded tube with a slotted threaded rod receiving end portion and receiving the clamp therearound or in the form of a split turnbuckle receiving clamps on both ends and having internal threads of opposite hand each receiving a threaded rod.

3,832,073
SWIVEL JOINT CONNECTION
Leopold J. Castellanos, Houston, Tex., assignor to Esso Production Research Company, Houston, Tex.
Division of Ser. No. 23,663, March 30, 1970, Pat. No. 3,636,716. This application July 28, 1971, Ser. No. 166,961
Int. Cl. F16c *11/00*
U.S. Cl. 403—121 **5 Claims**



A swivel joint for use in a buoyant articulated offshore platform. Two U-shaped interlocking links, each having a contact surface formed on the intermediate section connecting the two parallel extending sides, are oriented at 90° to each other. A plate is positioned between the two contact surfaces and the surfaces of the U-shaped links bear against a contact surface on each side of the plate when tensile forces are applied in opposite directions to the links. At least one of each of the contact surfaces bearing against each other is curved. The disposition of the curved bearing surfaces permits one of the links to rock against the intermediate plate in one plane whereas the other link can rock in a plane at 90° to the one plane. This arrangement permits the outer end of the link to swing in any direction with respect to the outer end of the mating link.

3,832,074
LINKAGE QUICK-CONNECT DEVICE
David C. Dehar, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed July 25, 1973, Ser. No. 382,624
Int. Cl. F16c *11/00*
U.S. Cl. 403—163 **4 Claims**



A linkage quick-connect device for coupling a threaded link rod to a lever member having an aperture therein. The quick-connect device comprises a swivel pin having a cylindrical head and a shank, the latter being adapted to have snap-fit into the aperture in the lever and to be retained therein. The swivel pin is axially slotted through its head into the shank, the

slot terminating short of the shank end remote from the cylindrical head whereby the symmetrical body portions are hingedly connected for flexing movement toward and away from each other. The cylindrical head has a cylindrical recess extending in a direction normal to the swivel pin axis and has gripping means engageable with the threaded link rod to prevent axial disengagement of the latter from the swivel pin head in a direction axially of the longitudinal axis of the link rod.

3,832,075

MECHANICAL CONNECTING DEVICE

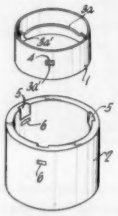
Akira Arai, 76, 2 chome, Soshigaya Setagaya-ku, Tokyo, Japan

Filed July 25, 1972, Ser. No. 275,030

Claims priority, application Japan, July 27, 1971, 46-66642; Aug. 5, 1971, 46-70016

Int. Cl. F16b *21/09*

U.S. Cl. 403—328 **4 Claims**



A separable coupling includes a female coupling member having a first circular peripheral wall provided with circumferentially spaced coplanar first slots and cam faces leading radially inwardly from the outer edge of the peripheral wall towards respective slots. A male coupling member has a second circular wall which slideably telescopes the first peripheral wall and has slots registering with the first slots. A locking member formed of resilient wire is located in the male coupling member and has integrally formed outwardly directed ears with outwardly converging side edges engaging corresponding pairs of registering slots. The peripheral walls may be conical or cylindrical and may be continuous or interrupted along their lengths. In joining the coupling members they are axially brought together with the cam faces contracting the ears until they register with and expand in the slots and by twisting one of the members relative to the other the ears are contracted out of the female slot permitting uncoupling.

3,832,076

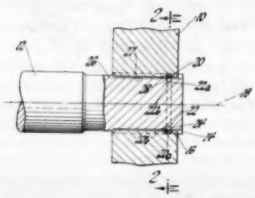
SPLINED ASSEMBLY WITH RETAINING RINGS

Glenn F. Gehrke, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 25, 1972, Ser. No. 291,897

Int. Cl. F16d *1/10*

U.S. Cl. 403—359 **3 Claims**



Male and female spline members are retained together by a retaining ring which is urged by ramps on one end of the splines of one of the members into an assembly-disassembly position in an annular groove on the other member and on proper mating of the members assumes a retention position in the first mentioned groove and in another groove in the one member which is ramped on one side to provide for disassembly by reversal of this assembly operation.

3,832,077

DEVICE FOR FIXING TEETH TO TOOTH HOLDERS IN EARTH-MOVING MACHINES

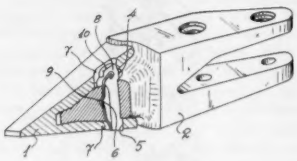
Juan Puertas Von Mehren, Barcelona, Spain, assignor to Elementos Para Traccion Y Excavaction, S.A. (E.T.E.S.A.), Madrid, Spain

Filed July 18, 1972, Ser. No. 272,731

Claims priority, application Spain, July 20, 1971, 171,010

Int. Cl. F16b *7/00*

U.S. Cl. 403—379 **5 Claims**



The most important characteristic of this invention consists of the employment of a cotter pin of a special form that tends to endow it with maximum elasticity, which is housed in the conjugated cavity of the tooth-holder, while it rests on the tooth, thus acting as a fixing element and a shock-absorbing element simultaneously, permitting an automatic fit, which absorbs the wear and tear that may be produced by working stresses.

3,832,078

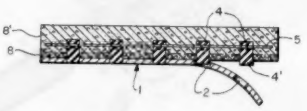
METHOD AND APPARATUS OF MANUFACTURING NON-SLIP PAVEMENT BLOCKS AND PRODUCT THEREOF

Fukuzo Nakayama, Hyogo, Japan, assignor to Japan Non-Slip Pavement Co., Inc., Osaka, Japan

Filed Aug. 18, 1972, Ser. No. 281,767

Int. Cl. E04b *5/04*

U.S. Cl. 404—44 **5 Claims**



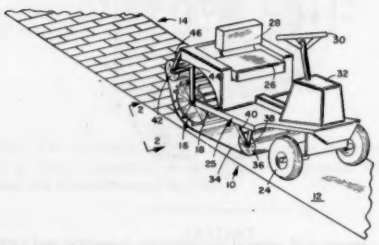
This invention relates to a method and apparatus for manufacturing pavement blocks and the product resulting therefrom in which said blocks have rubber tips projecting from the surfaces thereof, and includes inserting a perforated plate and introducing projection elements into the perforation and against the base plate, thereafter introducing filler material, compressing the ingredients, removing the compressed unit from, including the base, the frame and thereafter removing the base plate and perforated plate.

3,832,079

CONCRETE FORMING APPARATUS AND PROCESS

William V. Moorhead, 33052 Marina Vista Dr., Dana Point, Calif. 92629

Filed Aug. 10, 1972, Ser. No. 279,709
Int. Cl. E01c 7/35
U.S. Cl. 404—72 5 Claims



A concrete or paving forming apparatus and process comprising laying a concrete or paving material and allowing it to cure into a substantially plastic condition and then imprinting it with a pattern impressed therein in a continuous process. A plastic film, or other suitable release agent permits the forming apparatus to be driven into the concrete in a manner whereby it will not remove the surface of the concrete when it is withdrawn.

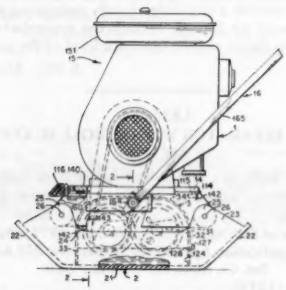
The apparatus generally comprises a roller with a series of patterns formed by means of blades that conform to the pattern that is to be pressed into the concrete. The roller effectively rolls in the pattern while at the same time a sheet of plastic film is laid down on the concrete ahead of the roller. Thus, as the roller is impressed into the concrete and removed, it will not gouge the concrete. Other release agents such as the silicones or the tetrafluorethylenes can be sprayed on the roller blades or on the concrete to prevent binding and gouging of the pavement.

3,832,080

VIBRATOR, ESPECIALLY A SELF PROPELLED REVERSIBLE TAMPER

Karl M. Stoecker, Mt. Arlington, N.J., assignor to Heinrich Machinery & Tool Mfg. Co., Inc., Stanhope, N.J.

Filed June 28, 1972, Ser. No. 267,127
Int. Cl. E01c 19/35
U.S. Cl. 404—133 11 Claims



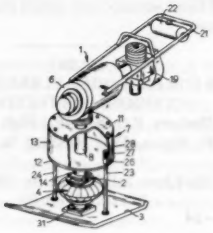
A vibrator, especially a self propelled reversible tamper having a base plate that is turned up at both ends, comprising a housing, a driving shaft and a driven shaft journaled in the housing, each shaft having an eccentric mounted thereon and a gear on each shaft for rotating them in opposite directions at the same speed. The eccentric on one shaft has a fixed connection with respect to its gear in a single angular relation thereto. The eccentric on the other shaft has a selective connection with respect to its gear in a plurality of angular relations thereto and the selective connection can be changed by suitable means from one angular relation to another during operation of the vibrator. This enables the tamper to be self propelling in two opposite directions. A handle pivoted to the base plate for movement through an arc from an operating position at one end to an operating position at the opposite end of the base plate may be provided to guide the moving tamper.

3,832,081

PNEUMATIC COMPACTING TOOL

Rudolph G. Opderbeck, New Berlin, and Horst H. Mattern, Milwaukee, both of Wis., assignors to Wacker Corporation, Milwaukee, Wis.

Filed June 28, 1973, Ser. No. 374,672
Int. Cl. E01c 19/34
U.S. Cl. 404—133 10 Claims



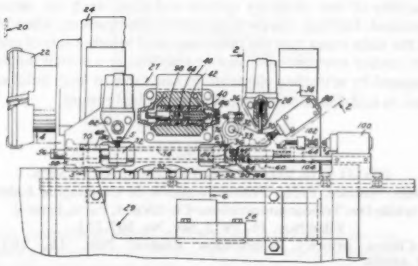
In a pedestal type of compaction tool a pneumatic power transmitting connection between a reciprocating drive plunger and a vibratory compacting shoe is established by means of an air spring which is cyclically collapsed and extended in response to back and forth movement of the plunger relative to the compacting shoe. The resonant frequency and amplitude of the compacting shoe vibrations may be varied by increasing and decreasing the pressure to which the air spring is inflated.

3,832,082

SERVO CONTROL FOR MANUFACTURING STATIONS

Edward E. Judge, Jr., 2104 Cumberland Rd., Lansing, Mich. 48906

Filed Nov. 10, 1972, Ser. No. 305,510
Int. Cl. B23b 49/04, 47/22; B23c 3/00
U.S. Cl. 408—10 18 Claims



The invention comprises a feed back control device for repetitive production machining of similar parts which senses

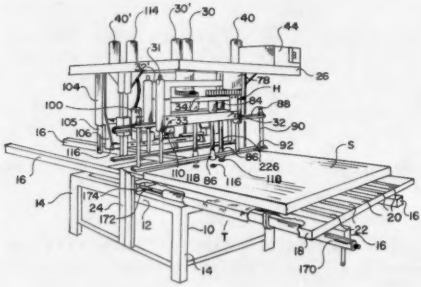
the position of each part at a machining station, modulates rapid and gradual movement of a machining carriage into accurate relationship with the part, compensating for any size variation between parts, controls the machining operation and the retraction of the carriage from the part. In one of the preferred embodiments the servo mechanism positions the carriage at one of a plurality of distinct part size positions the selection of which depends upon the end position of the part sensed and controls a machining operation at a corresponding accurately fixed position independent of minor variations in the sensed end position. In the other preferred embodiment the servo mechanism senses the part end position, and in response thereto controls the carriage position for beginning the machining operation on the part. The invention includes hydraulic valve means having fast forward, fast reverse and modulation modes. The valve means is controlled by mechanical linkage engageable by part sensing means, all of the above moving in coordination with the movement of the carriage. Upon the sensing of a part, the linkage actuates the valve means into modulation mode to position and control the operation of the machining head on the part. The control features hydraulic feed with mechanical lead screw accuracy of feed rate during the valve modulated machining phase together with rapid advance and retract phases under full unmodulated flow.

3,832,083

APPARATUS FOR PREPARING FURNITURE BACKS AND CUSHIONS FOR TUFTING

Benjamin F. Dockery, P.O. Box 452, High Point, N.C. 27261, and Jack H. Mason, 1822 Pershing St., High Point, N.C. 27260

Filed June 2, 1972, Ser. No. 259,196
Int. Cl. B27c *5/06*
U.S. Cl. 408—24 **23 Claims**



A horizontally reciprocal table carrying a foam rubber or polyurethane slab on the surface thereof is indexed past a vertically reciprocal operating head having mounted thereon a plurality of sets of rotary cutters and saws, each set, when operated, forming a portion of a prescribed pattern, whereby as the slabs index past the operating head selected sets of cutters and/or saws are activated in response to a switch means engaged by activating elements on said table to form holes or slots in said slab according to said prescribed pattern.

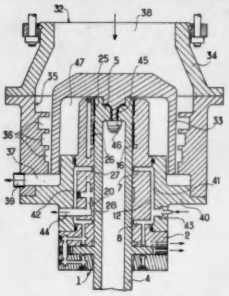
3,832,084

PIVOT FOR ROTATING MOLECULAR PUMPS

Louis Maurice, Paris, France, assignor to Compagnie Industrielle Des Telecommunications Cit-Alcatel, Paris, France

Filed Nov. 16, 1972, Ser. No. 307,231
Claims priority, application France, Nov. 16, 1971, 71.40995
Int. Cl. F01d *1/36*
U.S. Cl. 415—90 **24 Claims**

Pivot for rotating molecular pumps comprising a stator element fixed to the stator of the pump, a rotor element coupled to the rotor of the pump, and in the space comprised between the rotor and stator elements, a dynamic molecular seal, a



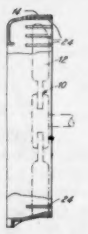
dynamic viscous seal, several gas bearings, a gas stop and a gas counter-stop.

3,832,085

AUTOMOTIVE FAN SHROUD

Raymond Henry DeFauw, Dearborn, and Raymond G. Murley, Dearborn Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 4, 1972, Ser. No. 295,048
Int. Cl. F01d *25/04*
U.S. Cl. 415—119 **3 Claims**



A shroud enclosing an automotive type fan has ridges projecting from the internal surface equally spaced circumferentially to provide a circumferentially undulating pattern to the axial flow of air forced through the space between the shroud and the fan to reduce the noise level of the shroud-fan combination.

3,832,086

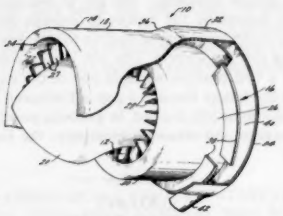
PARTICLE SEPARATOR WITH SCROLL SCAVENGING MEANS

Thomas Neil Hull, Jr., and James Leroy Nye, both of Marblehead, Mass., assignors to General Electric Company, Lynn, Mass.

Continuation of Ser. No. 201,421, Nov. 23, 1971, abandoned. This application Apr. 16, 1973, Ser. No. 351,622
Int. Cl. B04b *1/04*; **F04d** *29/00*
U.S. Cl. 415—121 G **6 Claims**

A particle separator for removing extraneous matter from the inlet flow to the compressor of a gas turbine engine has improved efficiency provided by a scroll type of scavenging means. The scroll scavenging means provides for removal of the particles from the collection chamber of the separator and limits the circumferential travel of the particles within the col-

lection chamber before removal, so as to reduce the likelihood that the particles will be rebounded back out into the engine



inlet. The invention herein described was made in the course of or under a contract or subcontract thereunder, (or grant) with the Department of the Army.

3,832,087

AXIAL TURBINE COMBINED WITH REVERSE TURBINE

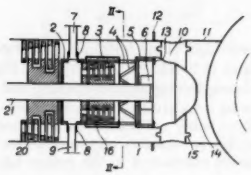
Paavo Lohonen, and Olof Karlsson, both of Finspong, Sweden, assignors to Stal Laval Turbin AB, Finspong, Sweden

Filed Oct. 15, 1973, Ser. No. 406,557

Claims priority, application Sweden, Oct. 20, 1972, 13563/72

Int. Cl. F01d *1/30, 1/04*

U.S. Cl. 415—153 **5 Claims**



A main axial turbine combined with a reverse turbine, the rotors of both turbines being mounted on the same common rotor shaft, with the reverse turbine housing suspended coaxially within the outlet portion of the main axial turbine by a symmetrical system of support plates or vanes, is disclosed.

3,832,088

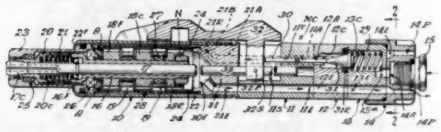
MODULAR PNEUMATIC SURGICAL DRILL

Harry W. Cromie, Pittsburgh, Pa., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Sept. 20, 1971, Ser. No. 181,999

Int. Cl. A61c *1/05;* **F01d** *1/10;* **A61b** *17/32*

U.S. Cl. 415—199 R **11 Claims**



A pneumatically driven turbine type drill has a modular casing that provides an air supply passage leading from a rear inlet and including an annular chamber leading to a front annular entry to the turbine and that provides an air exhaust passage leading from a sump at the rear of the turbine through a straight bore to a rear exit.

3,832,089

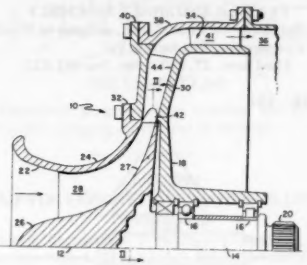
TURBOMACHINERY AND METHOD OF MANUFACTURING DIFFUSERS THEREFOR

Heinz F. Moellmann, New Haven, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Aug. 28, 1972, Ser. No. 284,144

Int. Cl. F04d *29/44, 29/54*

U.S. Cl. 415—207 **1 Claim**



A radial flow compressor is described which includes a diffuser having an annular entrance chamber surrounding the circumferential discharge of the impeller of the compressor. Diffuser channels extend from this annular chamber to an axial flow diffuser from which the compressed air is discharged into a collection chamber. The annular chamber is provided with contoured nodes from which the channel diffusers respectively extend at relatively low angles, tangentially in relation to the periphery of the impeller.

3,832,090

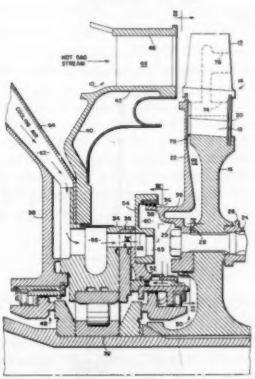
AIR COOLING OF TURBINE BLADES

Lawrence R. Matto, Shelton, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Dec. 1, 1972, Ser. No. 311,290

Int. Cl. F01d *5/08*

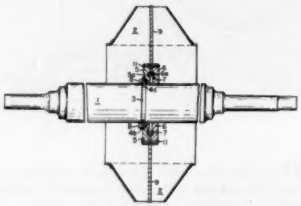
U.S. Cl. 416—95 **4 Claim**



A gas turbine engine is described, particularly the tur rotor portion thereof and the bearing for journaling this r Cooling air is directed along passageways extending thr the bearing mounting and discharged into an entry chamb the inner portion of the rotor. The rotor includes an an plate spaced from a disc on which the rotor blade mounted. The inner periphery of the plate defines th

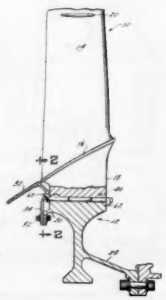
trance of a passageway means for the flow of cooling air from the entry chamber to and through the blades to cool them. Cooling air as it is directed into the entry chamber at an angle such that its tangential vector approximates the peripheral speed of the cooling air passageway entrances. Further, vanes are provided on the blades to facilitate flow of cooling air through the rotor passageway means.

3,832,091
FAN HUB AND SHAFT ASSEMBLY
Joseph H. Hoffman, Norwood, Mass., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Sept. 27, 1973, Ser. No. 401,523
Int. Cl. F04d *17/08*
U.S. Cl. 416—184 **5 Claims**



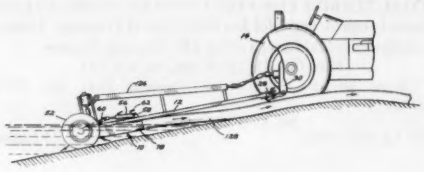
An apertured fan disc, hub and shaft assembly including a split ring located within a recess on the shaft, a principal hub shrunk onto the ring to secure the ring and the hub to the shaft, and the fan disc secured to the principal hub. If desired, a secondary hub complementary to the principal hub may be mounted on the shaft with the fan disc secured thereto between both the principal hub and the secondary hub. Also, the disc may be provided with a boss on the periphery of its aperture to be secured between the hubs.

3,832,092
DEVICE FOR LOCKING TURBOMACHINERY BLADES
Gary B. Manharth, Milford, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Oct. 19, 1973, Ser. No. 407,946
Int. Cl. F01d *5/32*
U.S. Cl. 416—220 **13 Claims**



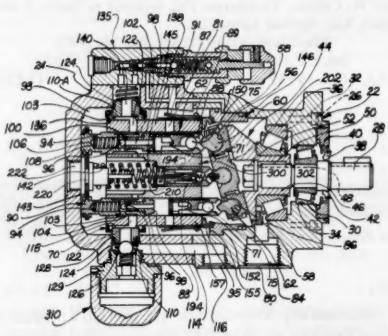
A blade-locking device, for locking radially projecting blades on a rotor, includes a spacer having a passage therethrough. The passage is accessible by means of an axial separation occurring at one side of the spacer; and the spacer is resiliently deformable to permit spreading of the separation from its undeformed position and returning the separation to its undeformed shape. A locking pin, having enlarged oblong integral ends at opposite extremities thereof, is formed and dimensioned so as to reside within the passage in a friction fit with each of the aforementioned ends projecting beyond the respective spacer extremity. The pin is disposed within the passage by deforming the spacer to enlarge the separation beyond the width necessary to receive the thickness of the pin and placing the pin therein. The pin is rotatable within the passage to a first position wherein one of the ends may pass freely with the spacer through a gap left between a blade tang and rotor slot to be interlocked. In a second position, the ends serve to engage and retain, respectively, the rotor and the blade tang.

3,832,093
PORTABLE PUMP
Daniel E. Shirek; Robert J. Shirek, and Charles J. Ryba, all of Michigan, N. Dak.
Filed Aug. 9, 1972, Ser. No. 278,937
Int. Cl. F04b *35/06*
U.S. Cl. 417—231 **9 Claims**



A portable centrifugal pump for moving or displacing large quantities of water in a relatively short time. The pump includes a volute casing having an inlet opening and a discharge opening. The casing is secured to a wheeled frame, such frame in turn being detachably connected to a tractor or similar vehicle. An impeller is rotatably mounted within the casing, and it is operatively connected to the power take-off of the tractor.

3,832,094
HYDRAULIC PUMP
Robert E. Raymond, Zanesville, Ohio, assignor to International Basic Economy Corporation, New York, N.Y.
Filed Mar. 23, 1973, Ser. No. 344,339
Int. Cl. F04b *1/00*
U.S. Cl. 417—222 **8 Claims**



A piston type hydraulic pump characterized by a relief clutch apparatus which functions to detect the occurrence of contaminates in the pumping oil and to automatically protect

the internal working components of the pumping mechanism from damage by such contaminates. More specifically, the relief clutch is arranged to automatically and substantially instantly relieve the pumping pistons from the forces of the piston driving cam upon the occurrence of any abnormal forces imposed on any one of the pistons by binding action of the contaminates. Hence actuation of the pistons is automatically stopped prior to the occurrence of irreparable damage to the machine.

3,832,095

FLUID PRESSURE ACCUMULATING APPARATUS

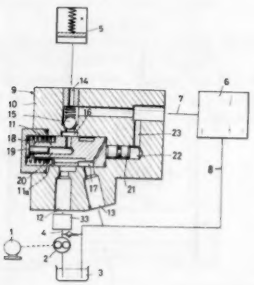
Akira Akima, Tokyo; Masao Nishikawa, Niiza; Makoto Sato, Saitama; Hiromitsu Miyahara, both of Tokyo, and Yoshitaka Miyakawa, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Chuo-ku, Japan

Filed Aug. 29, 1972, Ser. No. 285,096

Claims priority, application Japan, Aug. 30, 1971, 46-65822; Aug. 31, 1971, 46-66291

Int. Cl. F04b *49/08*

U.S. Cl. 417—307 **2 Claims**



Fluid pressure accumulating apparatus in which a supply conduit is connected between a fluid pressure pump driven by an internal combustion engine and an accumulator, a control valve being provided in the supply conduit such that when the pressure within the accumulator reaches an upper limit the valve responds thereto to form a short-circuit between the supply conduit and a return conduit whereas when the pressure within the accumulator reaches a lower limit the valve responds thereto so as to remove the short circuit. The control valve can be formed as a spool valve which is urged to a closing position by a spring acting on one end thereof and is urged to an opening position by the pressure within the accumulator acting on the other end thereof.

3,832,096

MULTITUBE PERISTALTIC PUMP WITH INDIVIDUAL PROGRAMMING CONTROL

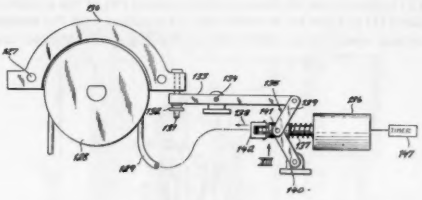
Daniel Gelfand, Brooklyn, N.Y., assignor to Buchler Instruments Division, Nuclear-Chicago Corporation, Fort Lee, N.J.

Division of Ser. No. 120,644, March 3, 1971, Pat. No. 3,723,030. This application July 19, 1972, Ser. No. 272,464The portion of the term of this patent subsequent to Mar. 27, 1990, has been disclaimed.

Int. Cl. F04b *43/08, 45/06, 43/12*

U.S. Cl. 417—475 **1 Claim**

A multitube peristaltic pump with individual programming control has a head provided with axially offset array of rollers against which respective tubes are held by pivotal bar segments. Individual programmable controls are provided for controlling the swinging movement of the bars.



3,832,097

PUMP FOR CONCRETE AND OTHER SLUDGING MATERIALS

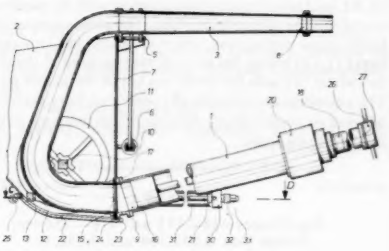
Karl Schlech, Bernhausen B. Stuttgart, Germany, assignor to Putzmeister Interholding GmbH, Basel, Switzerland

Filed Dec. 7, 1972, Ser. No. 313,128

Claims priority, application Germany, Dec. 16, 1971, 2162406

Int. Cl. F04b *15/02*

U.S. Cl. 417—516 **16 Claims**



A pump for concrete and other sludgy materials comprises a hopper with two parallel pump cylinders connected to the hopper, the open (head) ends of the cylinders opening to the interior of the hopper. A C-shaped discharge pipe is disposed in the hopper with its upper end connected to a delivery pipe which is disposed above the pump cylinders and which has its inlet end facing in the same direction as the head ends of the cylinders. The discharge pipe is oscillated to and fro about an axis above and parallel to the pump cylinders to bring the lower end of the discharge pipe into register with the open ends of the two pump cylinders alternately. Means may be provided for pressing the lower end of the discharge pipe against the open ends of the pump cylinders to minimise leakage.

3,832,098

EPICYCLIC HYDROPNEUMATIC DRIVE WITH INTERNAL-MESH GEARING

Daniil Andreevich Dudko, pereulok Mechnikova, 3, kv. 7; Mikhail Danilovich Sur, ulitsa Vladimirskaya, 98, kv. 52, and Grigory Bagradovich Asoyants, Bulvar Lesi Ukrainki, 2, kv. 16, all of Kiev, U.S.S.R.

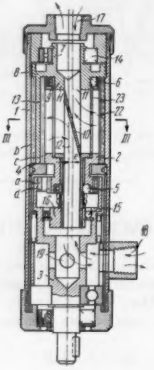
Filed Feb. 23, 1972, Ser. No. 228,668

Int. Cl. F03c *3/00*

U.S. Cl. 418—63 **4 Claims**

An epicyclic hydropneumatic drive is disclosed which includes a stationary sun wheel (*b*) and a movable sun wheel (*a*) with internal toothing. The housing (1) of the drive is made in-

tegral with the stationary sun wheel (*b*). The planet pinion (2) having two tooth rims (c and d) meshes with the sun wheels (*a*, *b*). The rims (*c*, *d*) of the planet pinion (2) are isolated from each other by the fixed partition (4). The planet pinion (2) is loosely set on the eccentric journal (9) of the pinion carrier (H) to form by its tooth rim (*c*) together with the stationary sun wheel (*b*) an interteeth working space having two zones



(A,B), said zones intercommunicating with the pipelines to let in and out the actuating medium. The pinion carrier (H) has a longitudinal passageway which is subdivided into two chambers (11,12) within the zone of intermeshing of the stationary sun wheel (*b*) with the tooth rim (*c*) of the planet pinion (2). The chambers are hermetically separated from each other and adapted to communicate with the respective zone of the interteeth working space.

ERRATA

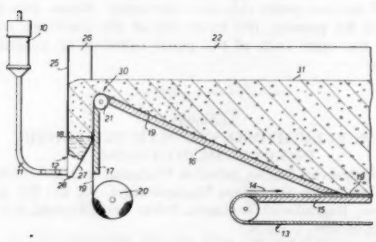
For Classes 418—113 and 418—154 see:
Patent Nos. 3,832,104 and 3,832,105

3,832,099

APPARATUS FOR PRODUCING POLYURETHANE FOAM

Laader Berg, Spjelkavik, Norway, assignor to Uniform AG, Glarus, Switzerland

Division of Ser. No. 174,412, Aug. 24, 1971, Pat. No. 3,786,122. This application May 22, 1973, Ser. No. 362,839
Int. Cl. B29d *27/00*
U.S. Cl. 425—4 C **20 Claims**



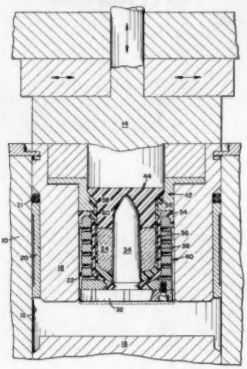
Apparatus for producing continuous polymeric foam slabs or strands, characterized in that the liquid foam reactants are initially introduced into the bottom of a vessel and the resulting foam is allowed to expand upwardly in the vessel owing to chemical reaction between the reactants. Prior to completion of the expansion of the foam mixture, the partially expanded foam is allowed to flow from the vessel over a weir structure, whereupon the foam completes the expansion process in a channel-shaped conveyor in which the foam is continuously moved away from the weir structure. According to one embodiment, the foam that flows over the weir moves down an inclined fall plate surface during completion of the foam expansion. In another embodiment, the expanding foam passes over the weir directly onto the horizontal reach of a conveyor.

3,832,100

TOOLING FOR RECEIVING AND SUPPORTING A QUANTITY OF POWDER MATERIAL TO BE PRESSED INTO A SELF-SUPPORTING COMPACT

Kenneth C. Baxendale, Macedon, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Jan. 5, 1973, Ser. No. 321,437
Int. Cl. B30b *5/02*, *11/02*; **B29d** *15/00*
U.S. Cl. 425—78 **12 Claims**



Isostatic tooling for receiving and supporting a quantity of powder material which is to be pressed into a self-supporting compact having a bore extending therethrough is described with reference to isostatic compacting techniques which utilize such tooling. The tooling includes a relatively rigid base member for supporting and positioning a core rod element extending into a deformable mold which can be suspended in a pressure vessel for receiving a high force for compacting a quantity of powder material contained within the deformable mold.

3,832,101

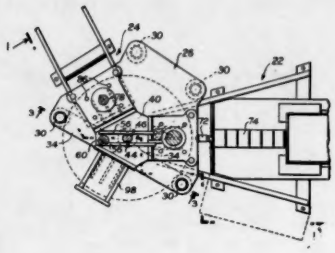
MOLDULAR CONSTRUCTION MULTI-STATION MOLDING APPARATUS

Dewey Rainville, Westfield, N.J., assignor to Rainville Company, Inc., Middlesex, N.J.

Filed June 4, 1973, Ser. No. 366,321
Int. Cl. B29d *23/03*
U.S. Cl. 425—242 B **15 Claims**

This invention is a multi-station molding machine of modular construction. Sections of a machine, such as an injection station; a pre-blow station; a full flow station; and a stripper station are made as individual performance units that can be assembled in different relations with respect to a central indexing unit and to each other. The individual performance units are shaped so that they can be fitted together in different ways to make complete molding machines from the standardized unit sections assembled in different ways according to the sequence of operations that are to be carried out for making a particular article. When the sections comprising the

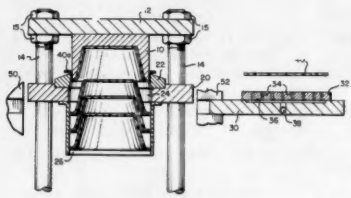
performance units are joined by detachable fastening means to a connector plate, they can be re-arranged as desired to change their machine from a three-step to a four or five step machine according to changes in the number of operations required for the article that is to be produced.



3,832,102
THERMOFORMING MACHINE WITH ARTICLES TRIMMED IN-PLACE

John D. Alroy, 380 Mountain Rd., Union City, N.J. 07087

Division of Ser. No. 88,805, Nov. 12, 1970, abandoned. This application Mar. 6, 1973, Ser. No. 338,554
Int. Cl. B29c *17/04, 17/08*
U.S. Cl. 425—292 **9 Claims**



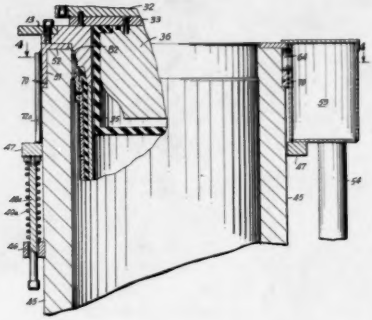
Apparatus for thermoforming plastic articles in which the articles have their edges trimmed while still being held in a mold cavity by moving the mold within a cutting die to produce a shearing cut of the plastic, the apparatus operating on a multiple basis so that an article is being formed while another is being trimmed, and an arrangement for batching the trimmed articles in groups of a predetermined amount.

3,832,103
ISOSTATIC PRESS

Arnold G. Bowles, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed Sept. 13, 1972, Ser. No. 288,703
Int. Cl. B30b *5/02, 11/02;* **B28b** *3/00*
U.S. Cl. 425—405 H **14 Claims**

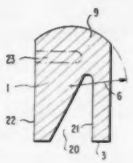
An improvement for use in combination with an isostatic press of the type wherein a mold is inserted into a pressure cylinder having liquid therein. The improvement resides in providing means for preventing the tilting of the mold as it is inserted into the cylinder. Additionally, the means for preventing tilting may also be employed to insure that liquid overflowing from the cylinder is not discharged onto other parts of the machine.



3,832,104
ROTARY PISTON INTERNAL COMBUSTION ENGINE

Heinz Lamm, Esslingen-St. Bernhardt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertierkheim, Germany

Filed May 6, 1970, Ser. No. 35,177
Claims priority, application Germany, May 7, 1969, 1923231
Int. Cl. F01c *19/02;* **F04c** *15/00, 27/00*
U.S. Cl. 418—113 **13 Claims**



A rotary piston internal combustion engine, particularly of trochoidal construction, which includes a rotating piston equipped at its corners with sealing bars which are constructed relatively wide for reducing wear and which are provided with slots and/or apertures for increasing their elasticity.

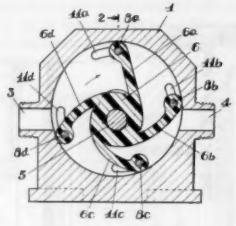
3,832,105
FLEXIBLE BLADE ROTARY PUMP

Kenryu Takahashi, 3-go, 22-ban, 1-chome, Higashitateishi, Katsushika-ku, Tokyo, Japan

Filed July 21, 1972, Ser. No. 273,813
Claims priority, application Japan, Apr. 14, 1972, 47-36963
Int. Cl. F01c *5/00;* **F03c** *3/00;* **F04c** *5/00*
U.S. Cl. 418—154 **1 Claim**

The present invention provides a rotary pump having a rotor between two rotary parallel plates, said rotor having at

regular intervals plural flexible blades and fixing at an eccentric shaft, said plate having along its circumference arc guide



holes as many as said blades, said guide hole inserted by a rod to pass through a hole of an end of said blade and to insert into another opposite guide hole.

3,832,106

APPARATUS FOR THE PRODUCTION OF SHAPED ARTICLES OF EXPANDED COHERED GRANULES OF THERMOPLASTIC MATERIAL, IN PARTICULAR POLYSTYRENE

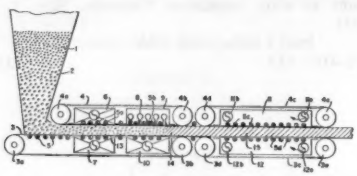
Andre Rivat-Lahousse, Paris, France, assignor to Saint-Gobain, Neuilly-sur-Seine, France

Division of Ser. No. 69,905, Sept. 8, 1970, Pat. No. 3,709,651, which is a division of Ser. No. 781,372, Dec. 5, 1968, abandoned. This application Sept. 15, 1972, Ser. No. 289,420

Claims priority, application France, Dec. 6, 1967, 67.131156

Int. Cl. B29d *27/02*

U.S. Cl. 425—4 **11 Claims**



Polystyrene sheet is made by continuously expanding and autogenously joining discrete particles of polystyrene, the granules being arranged in a moving layer of uniform thickness through which a series of heating gases are blown. The sheet may be compressed. The first heating is to about softening without major expansion of the particles, the second accomplishes the expansion. Penetration by the hot gases of the forming sheet is assisted by vacuum. Cooling of the formed sheet is by flow of cooling fluid parallel to its surfaces.

3,832,107

APPARATUS FOR MAKING ARTICLES FROM PARTICULATE MATTER

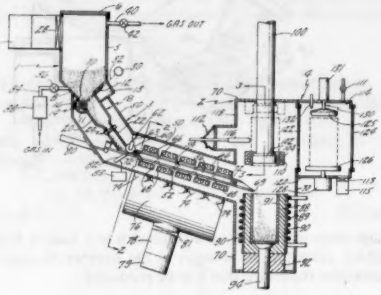
Arthur R. Cox, Jupiter, and Paul R. Holiday, Juno Beach, both of Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed June 29, 1973, Ser. No. 375,306

Int. Cl. B30b *11/02*

U.S. Cl. 425—78 **17 Claims**

An apparatus for receiving particulate matter of metal and producing a compact article therefrom. While the formation of a billet is shown, a contoured article could be produced if the proper configuration was formed on mating die faces. Particulate material is received in a hopper where it can be treated by gasses to aid in removing bulk water. To remove any gasses which would react with the material in an undesirable way, means are provided to place the hopper and transfer means under a vacuum for outgassing. Means are provided to transfer the metal particulate to a press means, at a controlled rate, while placing the particulate matter at the desired pres-



sure and proper temperature. The press means also includes means for receiving a container. The container will encase the billet after the particulate matter has been compacted. Means are provided to remove the completed billet after a top has been placed on the container and sealed. This sealing can be done by welding the top, or cap, thereon under vacuum condition.

3,832,108

INSTALLATION FOR FORMING MOLDED MEMBERS OF FIBROUS MATERIAL

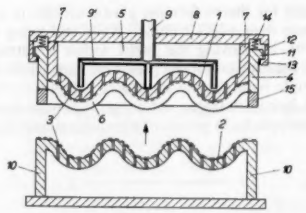
Heinz Posch, Berlin; Wolfgang Nauert, and Werner Lohner, both of Beckum, all of Germany, assignors to AMIANTUS AG, Niederurnen, Switzerland

Filed Dec. 11, 1972, Ser. No. 314,039

Claims priority, application Germany, Dec. 10, 1971, 2162030

Int. Cl. B29j *5/00;* **B28b** *3/02*

U.S. Cl. 425—85 **8 Claims**

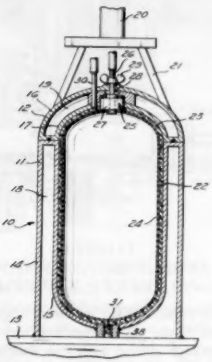


An installation for forming members of a fibrous material including cooperatively operating liquid-pervious basic and pressing forms forming a layer of material therebetween by expelling through the forms liquid from a solution containing the fibrous material; and a movable adjustable frame encompassing the basic form so as to control the extent of movement and pressing between the basic and pressing forms.

3,832,109
SPRUE SEALER

Henry U. Ranallo, Cleveland, and Edward T. LeBreton, Mentor, both of Ohio, assignors to Structural Fibers, Inc., Chardon, Ohio

Filed May 10, 1973, Ser. No. 359,208
Int. Cl. B29c 1/00
U.S. Cl. 425—112 4 Claims

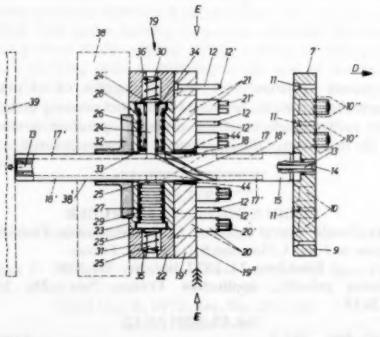


A sprue or resin drain closure assembly for use in apparatus employed to mold resin impregnated fiber articles is disclosed. Part of the assembly also serves as a device for removing molded articles from the mold. According to the invention, a stop or anvil is spaced laterally from a closure head, and the head is axially movable toward the stop. Movement of the head toward the stop seals a flexible extension of a sprue insert disposed therebetween. The stop may be pivoted away to permit the removal of the flexible extension from the sprue insert and the connection of a fluid supply thereto for providing a mold removal lifting force on the molded article through the sprue opening.

3,832,110
INJECTION MOLD FOR AN INJECTION MOLDING MACHINE FOR MANUFACTURING TWO-COMPONENT PLASTIC OBJECTS

Karl Hehl, Siedlung 183, D-7291, Lossburg, Germany

Filed June 16, 1972, Ser. No. 263,471
Claims priority, application Germany, June 16, 1971, 2129752
Int. Cl. B29f 1/12
U.S. Cl. 425—130 17 Claims

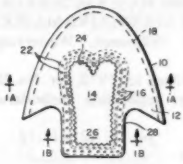


An injection mold for an injection molding machine for manufacturing two-component plastic objects. The mold includes a movable mold half having a core supporting profile plate, and a stationary mold half having a cavity plate and a transporting member. The profile plate has at least two diametrically disposed mold cores and the cavity plate has an equal number of diametrically disposed cavities. The shape of one-half of the mold cavities formed by the cores and cavities corresponds to the shape of part of the two-component object, and the shape of the other half of the mold cavities formed corresponds to the whole of the two-component object. The transporting member is pivotally mounted in the mold on an axis which is parallel to the opening direction of the mold and effects the transporting of the partly formed two-component object from its respective mold cavity into a mold cavity which forms the whole of the two-component object after the mold has been opened. The transporting member is configured as a plate separate from the profile plate and the cavity plate and is movable in the opening direction of the mold relative to the stationary mold half and to the movable mold half.

3,832,111
APPARATUS FOR MAKING COMPONENT PARTS OF SHOES AND THE LIKE COMPRISED OF THERMOPLASTIC SHEETING

Robert B. Dunlap, Medway, and Adrian E. Balfour, Framingham, both of Mass., assignors to Compo Industries Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 128,975, March 29, 1971, abandoned. This application Mar. 13, 1972, Ser. No. 234,033
Int. Cl. B29c 3/00
U.S. Cl. 425—174.2 14 Claims



The method of making relatively thin parts with a thermoplastic face having a predetermined surface configuration comprising providing a mold with the surface configuration desired to be imparted to the face, pressing and heating the material of the face in contact with the surface of the mold at a temperature such as to cause the material fused to take the impression of the mold and while the material is in a fused condition controlling flow of the material within the perimeter of the mold and cooling it to make permanent the impression imparted to the material.

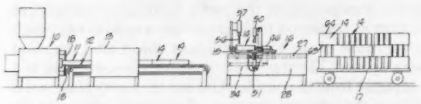
The apparatus for carrying out the method comprises a mold embodying the surface configuration to be imparted to the part, a press and a heat generator for fusing and applying molding pressure to the part. The mold is comprised of a material having a lower dielectric constant than the material of the part to be molded, preferably silicone rubber or a silicone containing material. Heating is effected in a high frequency field, preferably by connecting the platens of the press to the terminals of a high frequency generator. Optionally, two presses may be employed, one to effect fusing and molding and another to effect cooling while holding the part at molding pressure. If a single press is employed the platens of the press are preferably provided with cooling coils. Optionally, the part and the mold may be preheated.

3,832,112

APPARATUS FOR MAKING CERAMIC SHINGLES FROM EXTRUDED HOLLOW BLOCKS OF SOFT CLAY

Homer S. Dye, Hacienda Heights, Calif., assignor to Pacific Clay Products, Los Angeles, Calif.

Filed Jan. 2, 1973, Ser. No. 320,153
Int. Cl. B29c *17/14*
U.S. Cl. 425—291 8 Claims



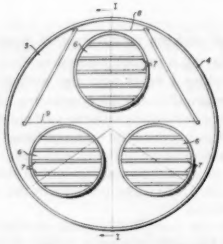
Ceramic shingles are produced from hollow blocks of soft clay cut from an extrusion. Each block is die formed at one end to produce an inward directed lip which will form the lower portion of a shingle. The blocks are stacked on parallel side edges while being heated to vitrify the clay, and afterwards portions of each block are discarded to produce two substantially duplicate ceramic shingles. Apparatus for die forming the hollow blocks of soft clay include internal and external dies to form the inward directed lips.

3,832,113

DEVICE FOR THE MANUFACTURE OF SMALL STICKS OF DOUGH-LIKE MATERIAL

Willem Hendrik Willemsen, Westervalge 83, Warffum, Netherlands

Filed Aug. 15, 1972, Ser. No. 280,748
Claims priority, application Netherlands, June 6, 1972, 7207636
Int. Cl. A21c *11/18*
U.S. Cl. 425—311 1 Claim



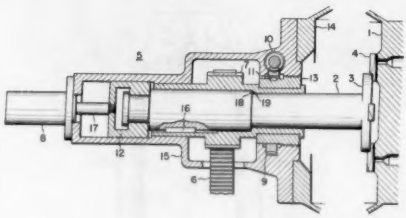
A device for the manufacturing of small sticks of dough-like material having different dimensions and different shapes by pressing said dough-like material out of a container having a bottom plate provided with at least one aperture subdivided by ribs into slots of different dimensions and shapes. Cutting means being provided under said plate for cutting off the dough-like material pressed through said slots by means of a piston arranged in said cylinder.

3,832,114

CUTTER SHAFT DEVICE IN A PELLETIZING APPARATUS FOR SYNTHETIC RESINS

Minoru Yoshida, Hiroshima, Japan, assignor to Japan Steel Works Ltd., Tokyo, Japan

Filed Feb. 5, 1973, Ser. No. 329,834
Claims priority, application Japan, May 12, 1972, 47-46437
Int. Cl. B29b *1/03*
U.S. Cl. 425—313 7 Claims



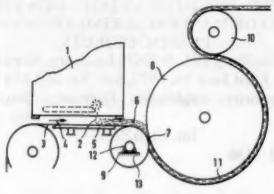
In a pelletizing apparatus for synthetic resins, the coarse and fine adjustments of the gap between a cutter knife and a die are effected through coarse and fine shiftings of the cutter shaft caused by the operation of separate means adapted for the coarse and fine shiftings, respectively.

3,832,115

APPARATUS FOR COMPRESSING CHIPBOARDS

Hubert Ettel, Teichhute, Germany, assignor to Wilhelm Mende & Co.

Filed May 23, 1972, Ser. No. 256,108
Claims priority, application Germany, May 29, 1971, 2126935
Int. Cl. B29j *5/08*; B30b *5/04*
U.S. Cl. 425—373 3 Claims



Improved apparatus for the production of chipboard wherein the gap width between two heated pressing members at the commencement of the pressing operation is smaller than the thickness of the chipboard to be manufactured.

3,832,116

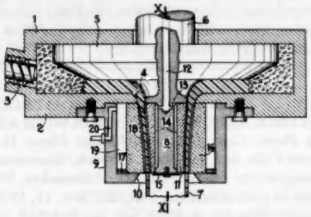
POROUS DIE PLATE EXTRUDER

Pierre Claude Marcel Delorme, Chalon-sur-Saone, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Nov. 24, 1972, Ser. No. 309,405
Claims priority, application France, Nov. 29, 1971, 71.42633
Int. Cl. B29f *3/012*
U.S. Cl. 425—381.2 4 Claims

Plate extruder comprising a fixed plate and a rotatable plate mounted in a body and a die head structure associated with

the body. The die head structure comprises a wall which defines the passage for the flow of the extruded material and is



of a material permeable to a gaseous fluid. Passage means put the side of the wall opposed to the passage in communication with a source of fluid under pressure.

3,832,117

UNIT FOR APPLYING COVERING SHEET FOR USE IN VACUUM SEALED MOLDING

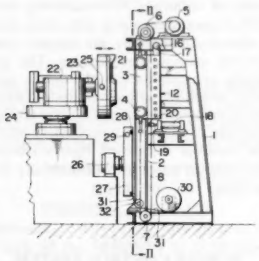
Itsuo Hijikata, Nagoya; Masayoshi Kasazaki, Toyokawa; Hideto Terada, Toyokawa, and Takao, Inoue, Toyokawa, all of Japan, assignors to Sintokogio, Ltd., Nagoya, Japan

Filed Oct. 11, 1973, Ser. No. 405,422

Claims priority, application Japan, Oct. 12, 1972, 47-102458; Oct. 12, 1972, 47-102459

Int. Cl. B29d *17/00*

U.S. Cl. 425—388 **11 Claims**



A covering sheet applying unit and a method for heating said covering sheet in which a covering sheet holding frame is movably provided between a pattern plate for vacuum sealed molding mold and a heating means for uniformly heating the covering sheet to be applied on the surface of said pattern plate, a pressing plate is disposed at the end of the moving range of said holding frame, the covering sheet drawn from the web of the covering sheet is held on said holding frame and then moved in the vicinity of said pattern plate, and the covering sheet is, after being uniformly heated, applied on the pattern plate.

3,832,118

APPARATUS FOR PRODUCTION OF CAST CONCRETE MEMBERS

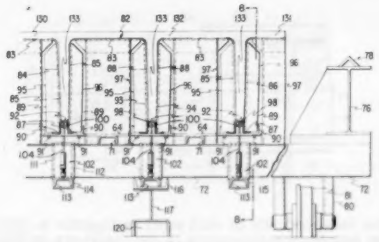
William E. Mitchell, Franklin, Tenn., assignor to Span-Deck, INC., Franklin, Tenn.

Filed May 8, 1972, Ser. No. 251,358

Int. Cl. B28b *7/10*

U.S. Cl. 425—443 **31 Claims**

Prestressed cast concrete structural members which are T-shape or multiple T-shape in cross section are cast in a metal mold. Each T portion of the mold comprises inverted L-shape form members, the depending portions of which have pin members affixed thereto. The pin members are cooperatively received in diagonal slots of a horizontally movable cam plate. Movement of the cam plate causes the depending portions to move laterally away from one another to enable stripping of the cast member from the form. A separately constructed ver-



tically movable horizontal pallet member forms the bottom surface of the form and includes a roller transfer assembly supported on an elevator mechanism. By cam action, the cast member is raised and then transferred to a roller conveyor which engages the bottom surfaces of the extending arms of the cast member. The roller conveyor transfers the member to another work area.

3,832,119

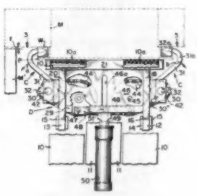
VIBRATILE MOLD WITH PALLET CLAMPING APPARATUS

Robert J. Woelk, Alpena, Mich., assignor to Besser Company, Alpena, Mich.

Division of Ser. No. 33,248, April 30, 1970, Pat. No. 3,660,004. This application Mar. 13, 1972, Ser. No. 234,423

Int. Cl. B28b *1/08*

U.S. Cl. 425—432 **10 Claims**



Concrete block molding machinery having apparatus for moving a block receiving pallet against a mold assembly which is used in forming building blocks. The apparatus includes rotatable clamp arms and clamp receiving members having cooperating wedging surfaces, the clamp arms being movable into and out of engagement with the clamp receiving members to move the pallet supporting members toward and away from the mold assembly to clamp and unclamp the pallet to and from the mold.

3,832,120

INTERNAL DECKLE STRUCTURE

Ronald L. Shaffer, Downingtown, Pa., assignor to Beloit Corporation, Beloit, Wis.

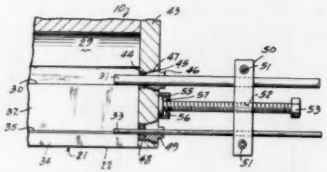
Filed Oct. 19, 1972, Ser. No. 299,043

Int. Cl. B29d *7/04*

U.S. Cl. 425—466 **10 Claims**

Internal deckle structure for extruder dies for plastic film. The deckle structure includes a primary deckle placed in the

pre-land area of the die to disrupt the edge of the molten plastic material and minimize edge bead and to serve as a seal for the melt flow passageway. A second deckle is placed in the transition area of the die between the pre-land area and the final land area defining the discharge orifice of the die. The deckles may be horizontally adjusted along the pre-land area of the die dependent upon the width of the film extruded



either independently of each other or together to provide a most effective arrangement for sealing and necking down the plastic film as it leaves the die. A clamp and screw structure is provided for adjustably moving the deckles in and out along the die and conical split locking nuts are provided for locking the deckles in fixed relation with respect to each other and with respect to the die, where required.

3,832,121

FUEL INJECTOR FOR BLAST FURNACE

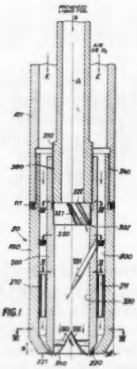
Paul Metz, Luxembourg; Victor Koch, and Robert Schockmel, all of Esch/Alzette, Luxembourg, assignors to Acieries Reunies de Burbach-Eick-Dudelange S.A.-ARBED, Luxembourg, G.D. de Luxembourg

Filed Jan. 29, 1973, Ser. No. 327,835

Claims priority, application Luxembourg, Jan. 28, 1972, 64674

Int. Cl. F23c *5/00*

U.S. Cl. 431—8 **20 Claims**



An injector for a combustible mixture, to be discharged across the tuyeres of a blast furnace, has an inner tube for the passage of a stream of liquid fuel and an outer tube traversed by a flow of oxidizing gas (air or oxygen) under pressure, the fuel stream passing through an obliquely perforated insert which directs it along helicoidal paths onto the peripheral tube wall to form a layer progressing toward the discharge end of the injector. Between that discharge end and the insert, the fuel layer is subjected to radially outwardly acting pressure from a gas, which may be branched off the surrounding flow of oxidizing gas, admitted generally tangentially into the inner tube through a set of nozzles extending skew to the tube axis, thereby reducing the thickness of the fuel layer. The surrounding gas flow, also set in swirling motion by passing through a fluted or perforated ring, impinges upon this thinned fuel layer at the discharge end and atomizes it. The exit speed of the fuel stream may be increased by disposing an inwardly pointing axial cone in the discharge end of the inner tube, leaving a narrow annular channel through which the fuel and its entraining gas pass into contact with the surrounding gas flow exiting through a narrow gap between the tubes.

3,832,122

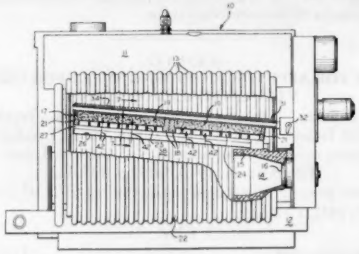
REDUCTION OF NITROGEN OXIDES FROM PRODUCTS OF HYDROCARBON COMBUSTION WITH AIR

Paul G. La Haye, Cape Elizabeth, Maine; Glenn D. Craig, Menomonee Falls, and Joseph L. Turecek, Shorewood, both of Wis., assignors to Aqua-Chem, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 198,767, Nov. 15, 1971. This application Jan. 6, 1972, Ser. No. 215,762

Int. Cl. F23l *9/00*

U.S. Cl. 431—10 **20 Claims**



Fuel is burned in a primary combustion zone so that a substantial quantity of unburned hydrocarbons, such as carbon monoxide (CO) is produced along with some nitrogen oxides (NOx) and whereby essentially no oxygen remains at the completion of the combustion process. The gaseous combustion products are conducted through a gas dispersion matrix or bed in which the unburned hydrocarbons and NOx react to produce carbon dioxide (CO_2) and nitrogen (N_2). Air is then injected into the gases in a secondary combustion zone to oxidize the residual unburned hydrocarbons to CO_2 in which case the exhaust gases are substantially free of air polluting CO and NOx.

3,832,123

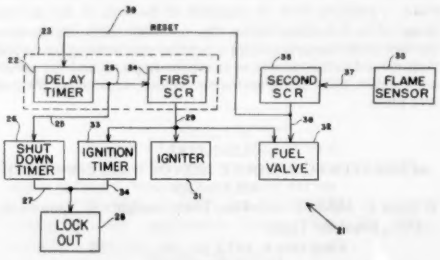
BURNER CONTROL SYSTEM

Lyman H. Walbridge, Ashland, Mass., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Nov. 15, 1972, Ser. No. 306,591

Int. Cl. F23h *5/00*

U.S. Cl. 431—78 **26 Claims**



Disclosed is a fail safe burner control system with a valve controller for operating a burner, a flame rectification flame

detector and a spark igniter apparatus. A first electronic switch opens the valve and starts the igniter. Upon the occurrence of flame, a second electronic switch, in response to the rectification detector, disables the first switch thus stopping the spark, but holds the valve open as long as flame is sensed. If flame is lost, the first switch is enabled automatically. In the event of failure to reignite after a loss of flame, the continued operation of the sparking igniter causes a circuit breaker to lock out the system.

3,832,124

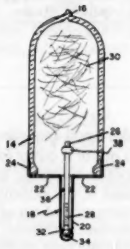
PHOTOFLASH LAMP

Frederick Loughridge, 10 Goldfinch Way, Ipswich; Frederick Koury, 26 Eastern Ave., and Warren Hay, 399 Asbury St., both of Hamilton, all of Mass.

Filed Oct. 2, 1972, Ser. No. 294,308

Int. Cl. F21k *5/02*

U.S. Cl. 431—93 **6 Claims**



A percussive-type photoflash lamp having an envelope comprised of a glass having a low coefficient of thermal expansion and a depending metal primer tube which is sealed to the glass envelope in a manner placing the glass under compression.

3,832,125

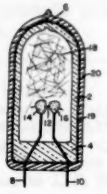
PHOTOFLASH LAMP

Thomas P. McDonough, Allenwood, and John W. Shaffer, Williamsport, both of Pa., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 20, 1972, Ser. No. 308,167

Int. Cl. F21k *5/02*

U.S. Cl. 431—94 **9 Claims**



A photoflash lamp having a thin film coating of highly adherent, low elongation polymeric resin on the exterior surface of its glass envelope, with a much thicker and higher elongation polymeric coating covering the thin film coating.

3,832,126

LIQUEFIED GAS FUELED LIGHTER

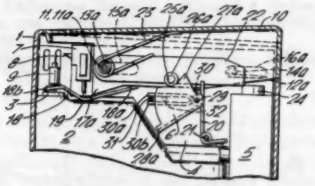
Nobuyoshi Moriya, Urawa, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kawaguchi-shi, Saitama, Japan

Filed May 26, 1972, Ser. No. 257,187

Claims priority, application Japan, June 8, 1971, 46-48075

Int. Cl. F23q *7/12*

U.S. Cl. 431—131 **26 Claims**



A liquefied gas fueled lighter comprising a housing, a normally closed gas fuel discharge valve and a piezoelectric high voltage generation device disposed within the housing, an actuating member, a hammer rotatably secured to the actuating member, means for slidingly interconnecting the actuating member and the housing whereby the actuating member may be substantially linearly displaced from a first position to a second position whereat the rotation of the hammer will result in the hammer striking the piezoelectric device, a spring interposed intermediate the hammer and the actuating member, means for opening the normally closed fuel gas discharge valve and for subjecting the spring to a compressive force having at least a predetermined magnitude and selective direction as the actuating member is displaced from the first to the second position thereof, and means for releasing the hammer when the actuating member is at the second position whereby the hammer will be forcefully propelled towards and impact against the piezoelectric device whereby a spark will be generated proximate the fuel gas discharge valve for igniting the discharged gas fuel.

3,832,127

IGNITION DEVICE

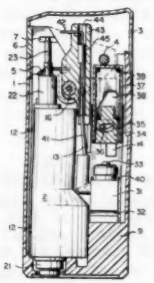
Nobuyoshi Moriya, Urawa, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Saitama, Japan

Filed June 20, 1973, Ser. No. 371,758

Claims priority, application Japan, June 20, 1972, 47-72733

Int. Cl. F23q *2/16*

U.S. Cl. 431—344 **16 Claims**



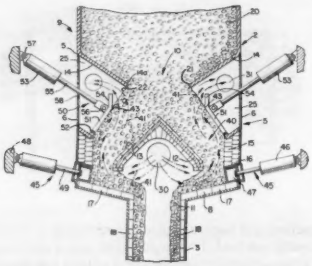
An ignition device comprises a casing formed of two halves which are integrally secured to each other and which are provided with a support arrangement for holding thereon a high voltage generating means and other elements.

3,832,128

PROCESS AND APPARATUS FOR PREHEATING SOLID PARTICULATE MATERIALS

Kermit D. Paul, Bethlehem, Pa., assignor to Fuller Company, Catasauqua, Pa.

Filed July 11, 1973, Ser. No. 378,289
Int. Cl. F27b 1/10
U.S. Cl. 432—17 13 Claims



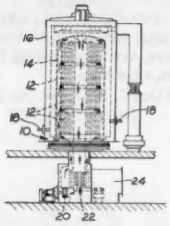
A method and apparatus for preheating solid particulate materials such as limestone and materials used in the process of making sealed surface lightweight aggregate. It includes a vessel having an inlet for solid particulate material and an outlet for solid particulate material, an inlet for hot gases and an outlet for gases. A preheating zone is defined by a bridge, the floor of the vessel and the vessel sidewalls. A valve arrangement is provided for controlling the length of the gas flow path through the preheating zone. When the valve is in one extreme position, the flow path through the gas-solids contact zone is the longest, and when the valve is in the other extreme position, the flow path through the gas-solids zone is at its shortest. The position of the valve may be controlled in response to either the pressure drop across the preheating apparatus or the temperature of the material discharged from the preheater.

3,832,129

COIL ANNEALING FURNACES

Alfred Derbyshire; Kenneth William Ivins, and Edward Thomas Whetton, all of Sutton Coldfield, England, assignors to Wellman Incandescent Furnace Company Limited, Worcester, England

Filed Apr. 5, 1973, Ser. No. 348,455
Claims priority, application Great Britain, Apr. 6, 1972, 15859/72; Jan. 19, 1973, 2826/73
Int. Cl. F27b 11/08
U.S. Cl. 432—77 10 Claims



The invention provides a coil annealing furnace in which atmosphere is circulated out of a cover enclosing the coils and via an external circuit before returning to the cover, in which a heat exchanger is located in the external circuit but is physically movable so that when moved out of the circuit there is no impediment to free circulation through the circuit such as is inevitably provided when the heat exchanger is in the circuit, and with a seal between the cover and furnace structure comprising a compressed rubber ring which is watercooled, so as to prevent seal failure through pressure fluctations when the heat exchanger is moved into the circuit.

CHEMICAL

3,832,130

METHOD AND COMPOSITION FOR PREVENTING DETERIORATION OF HIDES FROM FRESHLY SLAUGHTERED ANIMALS

Elmer A. Weaver, Spring Mount, William J. Hopkins, Philadelphia, and Alfred H. Korn, Maple Glen, Pa., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed July 28, 1972, Ser. No. 275,988

Int. Cl. C14c *1/00*

U.S. Cl. 8—94.18 **9 Claims**

Hides from freshly slaughtered animals are preserved and prevented from deteriorating by treatment with a synergistic mixture of water, acetic or propionic acid, and N,N'-bis(methoxy)methyl uron. Sodium acid sulfate is also used in place of the acetic or propionic acid. A surfactant is usually added to the mixture for wetting or emulsifying purposes. However, it is not an essential element for the synergistic action. The amount of water can be varied greatly, from 10 to 100%, based on the weight of the hide, without affecting the efficacy of the treatment. Excellent results are obtained with a mixture containing 10% water, 0.03% surfactant, 1.0% acid and 0.2% uron derivatives, all amounts based on the weight of the hide.

3,832,131

TREATMENT OF FIBRES

Derek James Rowland Massy and Kenneth Winterbottom, Cambridge, England, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Mar. 15, 1972, Ser. No. 235,036

Claims priority, application Great Britain, Apr. 19, 1971, 9,767/71

Int. Cl. D06m *15/54, 15/36*

U.S. Cl. 8—115.6 **8 Claims**

Cellulosic textiles are treated with an ester which contains, on average, at least two mercaptan groups per molecule, and with an aminoplast which is free from ethylenic unsaturation, and the aminoplast is cured. The treated textiles have enhanced dimensional stability, resistance to creasing, and may have permanent creases imparted, whilst having a fuller, softer handle and increased tear strength compared to cellulosic textiles treated with the aminoplast alone.

Typically, the ester is prepared by the reaction of

(a) a compound containing at least two carboxylic acid groups,

(b) a compound containing at least two alcoholic hydroxyl groups and, optionally,

(c) a compound containing not more than one carboxylic acid group or alcoholic hydroxyl group, especially a monomercaptomonocarboxylic acid or a monomercaptomonohydric alcohol.

3,832,132

PROCESS FOR IMPROVING THE DIMENSIONAL STABILITY OF WOOL-CONTAINING FABRICS

Giuliana C. Tesoro, Dobbs Ferry, N.Y., and Stephen B. Sello, Cedar Grove, and Rudolf F. Wurster, Weehawken, N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

No Drawing. Filed Nov. 8, 1968, Ser. No. 774,499

Int. Cl. D06m *13/38*

U.S. Cl. 8—127.6 **7 Claims**

This invention concerns a novel process for modifying proteinaceous substrates comprising treating said substrates with polyfunctional reagents derived from urea and heating the treated substrate until the desired modification takes place.

3,832,133

PROCESS FOR SHRINKPROOFING WOOL

Billy M. Culbertson, Burnsville, Edward A. Sedor, Bloomington, and William J. McKillip, Minneapolis, Minn., assignors to Ashland Oil, Inc.

No Drawing. Filed Mar. 21, 1969, Ser. No. 809,393

Int. Cl. D06m *13/42*

U.S. Cl. 8—127.6 **9 Claims**

Linear addition polymers having multiple aliphatic isocyanate functionality are employed to impregnate a wool or wool-containing substrate to provide a treated substrate exhibiting excellent dimensional stability characteristics.

3,832,134

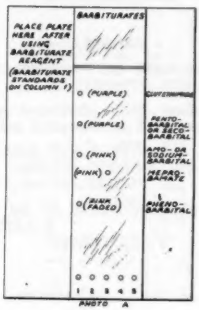
TLC METHOD AND DEVICE FOR DETECTING THE PRESENCE OF TARGET SUBSTANCES IN UNKNOWN SOLUTIONS

David Sohn, 8 Muriel Ave., Lawrence, N.Y. 11559

Filed Oct. 4, 1971, Ser. No. 186,268

Int. Cl. G01n *31/08, 33/16*

U.S. Cl. 23—230 B **5 Claims**



TLC method and device for testing urine or other body fluids for the presence of target substances. The device includes (1) a thin layer chromatographic plate into which target standards have been incorporated at selected starting points and (2) a photodiagram showing the appearance of a developed plate which had been prepared with the same target standards. Comparison, after development, of the plate to which a test solution had been applied, to the photodiagram verifies the test procedure while also determining the presence or absence of the target substances in the test solution.

3,832,135

AUTOMATIC CLINICAL ANALYZER

Robert J. Drozdowski, Mount Arlington, Peter F. Connolly, Boonton, Italo M. Massaglia, Middletown, and John Rudolph Chlupsa, Paterson, N.J., assignors to Becton, Dickinson and Company, East Rutherford, N.J.

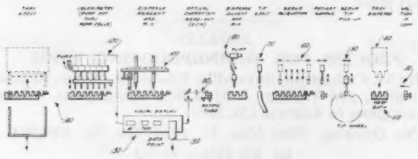
Filed Apr. 5, 1972, Ser. No. 241,113

Int. Cl. G01n *1/14, 1/18*

U.S. Cl. 23—230 R **11 Claims**

An automatic clinical analyzer for automatically transporting an identifiable sample of fluid to be tested to a distribution point where the sample is aliquoted to a series

of reaction cups for conducting a series of desired tests on the sample and accumulating the results of the test for

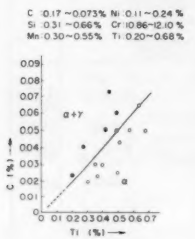


coordination of the test results with the identifiable sample.

3,832,136
DOUBLE WALLED TUBE OF HIGH CHROMIUM STEEL

Tsuyoshi Ohama, Ichikawa, and Konosuke Shinohara, Tokyo, Japan, assignors to Nisshin Steel Co. Ltd., Tokyo, Japan

Filed July 21, 1972, Ser. No. 273,771
Claims priority, application Japan, Aug. 4, 1971, 46/58,278
Int. Cl. B32b *15/00*
U.S. Cl. 29—191 **2 Claims**



A double wall tube is composed of a twice coiled or rolled copper-plated high chromium steel strip essentially composed of not higher than 0.04% C, not higher than 0.50% Si, not higher than 0.50% Mn, not higher than 0.50% Ni, 10.0–14.0% Cr, not higher than 0.50% and not lower than C percent × 10 of Ti, and iron balance and the outer surface of the tube being coated with a lead-tin coating.

3,832,137
GAS PHASE RADIOANALYTICAL METHOD AND APPARATUS

Sandor Mlinko, Dezso Banfi, Emilia Dobis, Jozsef Ottinger, Karoly Payer, Tivadar Palagyi, and Agnes Turi, Budapest, Hungary, assignors to Gyogyszerkutato Intezet and Kozponti Kemiai Kutato Intezet, both of Budapest, Hungary

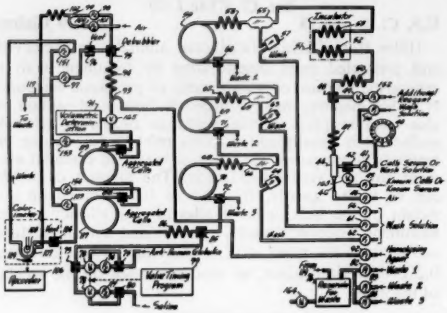
Filed Sept. 14, 1971, Ser. No. 180,311
Claims priority, application Hungary, Sept. 14, 1970, GO-1,147
Int. Cl. G01n *23/00, 31/12*
U.S. Cl. 23—230 PC **5 Claims**

Process and apparatus for the automatic, continual, gas phase determination of the radioactivity of a substance labeled with ^{14}C isotope involving oxidizing the substance to $^{14}CO_2$ with excess oxygen, removing the unconsumed oxygen as water after reaction with hydrogen and transporting the $^{14}CO_2$ to a detector for radioactive counting.

3,832,138
APPARATUS FOR PERFORMING THE ANTI-HUMAN GLOBULIN COOMBS TEST

Nathan M. Hirsch, 191 Wallington Ave., Wallington, N.J. 07055

Original application June 2, 1969, Ser. No. 829,385, now Patent No. 3,677,710. Divided and this application Apr. 6, 1972, Ser. No. 241,756
Int. Cl. G01n *33/16*
U.S. Cl. 23—253 R **4 Claims**

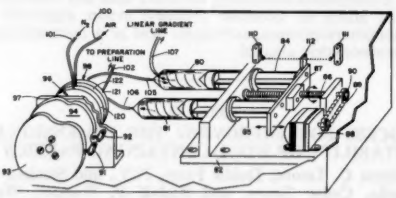


A new apparatus is provided for automatically performing the Coombs anti-human globulin test in a continuous flow system. Central to both the method and the apparatus is a new cell washing technique which permits continuous washing of the cells that are to be reacted with the Coombs serum. This new technique involves gravitational settling and separation of aggregated cells from a supernatant material. The gravitational separation step is also used to separate the agglutinated cells from the dissociated cells after a Coombs reaction has taken place.

3,832,139
LINEAR GRADIENT GENERATOR

Alan H. Runck, Marblehead, and Cesare Robert Valeri, Boston, Mass., assignors to the United States of America as represented by the Secretary of the Navy

Original application Jan. 31, 1972, Ser. No. 222,226, now Patent No. 3,779,708. Divided and this application June 15, 1973, Ser. No. 370,514
Int. Cl. G01n *1/26, 33/16*
U.S. Cl. 23—253 R **8 Claims**



An apparatus for combining two gases so as to produce a linear gradient of one with respect to the other is provided. Two substantially identical syringe-plunger combinations are secured together and their plungers are connected in tandem for automated reciprocating movement. A gas supply line is connected to each of the

syringes so as to introduce a different gas into each syringe at a point remote from the plungers therein. The supply lines can be reversed or interconnected by a valve means connected thereto and to individual gas sources, and an output is taken from one of the syringes at a point adjacent to the supply line connection thereto. A linear change in concentration of one gas in the other from 0 to 100% is achieved by first filling the syringes simultaneously via withdrawal of the plungers, next interconnecting the syringes through the supply lines, and then advancing the plungers at a uniform rate whereby the gas in one syringe is forced into and mixes with the gas in the other syringe while the mixed gases are forced out of the other syringe.

3,832,140

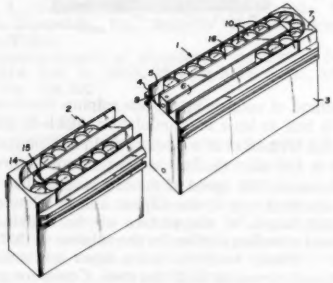
AUTOMATED APPARATUS FOR CHEMICAL ANALYSES

Eckehard Lorch, Reinach, Paul Sommer, Pratteln, and Hansjorg Tschirky, Ettingen, Switzerland, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

Filed Apr. 24, 1972, Ser. No. 247,052

Int. Cl. G01n *33/00, 33/16*

U.S. Cl. 23—259 **12 Claims**



An apparatus for automatically performing chemical analyses comprising at least 2 unit-assembly elements each bearing at least one endless conveyor having a sliding surface which has disposed thereon a number of sample containers and which is adapted for intermittent movement of the sample containers to various stations for treatment or testing, is described.

3,832,141

PRESSURE DIFFERENTIAL FILTERING APPARATUS

Ioakim Haldopoulos, Fairburn, Ga., assignor to Glasrock Products, Inc., Atlanta, Ga.

Filed Jan. 3, 1973, Ser. No. 320,831

Int. Cl. B01d *33/00*

U.S. Cl. 23—259 **5 Claims**

A pressure differential filtering apparatus which includes an elongated sampling tube, open at both ends, one end having a resilient lip forming a piston. A filter is mounted within a longitudinal passageway within the piston. The lower surface of the lip is capable of forming a seal with the interior walls of a container holding the liquid to be filtered and the upper surface is provided with a plurality of raised portions, such as serrations, corrugations, or nodules, so that the upper surface is incapable of forming a seal with the interior walls of the container.

This arrangement allows the passage of air around the resilient lip upon withdrawal from the container so that the sample collected in the tube is not sucked back into the container through the filter.

3,832,142

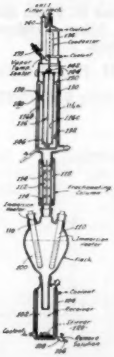
APPARATUS FOR PROCESSING HEXANITROSTILBENE

Leroy J. Syrop, Sepulveda, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.

Original application Oct. 2, 1970, Ser. No. 77,653, now Patent No. 3,699,176. Divided and this application Aug. 24, 1972, Ser. No. 283,333

Int. Cl. B01d *5/00, 11/04*

U.S. Cl. 23—272.6 S **1 Claim**



An improved apparatus is provided for processing the explosive known as hexanitrostilbene (HNS) from a form known as HNS–I into a form known as HNS–II, to provide a refined product with a unique crystal form so as to facilitate handling of the material. The apparatus of the invention uses an improved extraction technique involving the use of a solution of acetonitrile in which HNS–I is soluble and xylene in which HNS is insoluble for refining the HNS–I into an improved type of HNS–II.

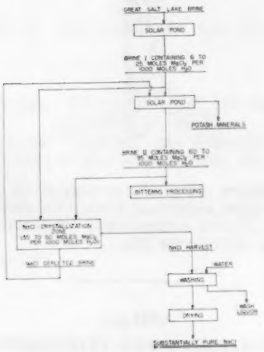
3,832,143

CRYSTALLIZATION OF SODIUM CHLORIDE

Ulrich E. G. Neitzel, Heringen (Werra), Germany, assignor to Irving Trust Company, as trustee

Continuation-in-part of application Ser. No. 735,840, June 10, 1968, now Patent No. 3,589,871, and a continuation-in-part of Ser. No. 756,071, Aug. 28, 1968, now Patent No. 3,592,615, and this application is a continuation of Ser. No. 807,573, Mar. 17, 1969, now Patent No. 3,615,259. This application June 22, 1971, Ser. No. 155,596

Int. Cl. B01d 9/02; C01d 3/06; C01f 5/30
U.S. Cl. 23—296 8 Claims



Substantially pure sodium chloride of relatively fine crystal size is crystallized by mixing two brines saturated with respect to NaCl and containing different concentrations of $MgCl_2$.

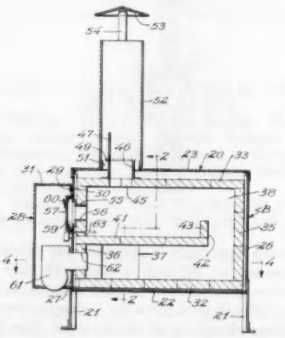
3,832,144

SMOKE ELIMINATOR

Robert H. Wieken, West St. Paul, and Harland C. Potter, White Bear Lake, Minn., assignors to Temperature Control Inc., St. Paul, Minn.

Filed Sept. 21, 1972, Ser. No. 290,834

Int. Cl. F23c 9/04; F23g 7/06
U.S. Cl. 23—277 C 4 Claims



A smoke eliminator is connected to the chimney usually leading from an incinerator or the like. The eliminator includes a chamber capable of withstanding high temperatures. A power burner is provided to pre-heat the chamber. The temperature is sufficient to burn out the major portion of the impurities caused by the firing of the incinerator as the gases travel a tortuous path.

3,832,145

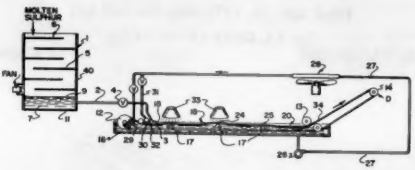
METHOD AND APPARATUS FOR THE SOLIDIFICATION OF MOLTEN SULPHUR

Ernest Ralph Ellithorpe and Ronald Bruce Fletcher, Calgary, Alberta, Canada, assignors to Vennard & Ellithorpe Ltd., Calgary, Alberta, Canada

Filed Dec. 14, 1971, Ser. No. 207,909

Claims priority, application Canada, Dec. 24, 1970, 101,481

Int. Cl. C01b 17/02, 17/14
U.S. Cl. 23—293 S 4 Claims



A method of solidifying molten sulphur involves forming on a belt at least one undulation which is shaped to permit the formation of a pool of molten sulphur. Molten sulphur is fed onto the belt so that a pool is formed on the undulation. The speed of the belt is controlled in relation to the feed rate of the sulphur and in relation to the angle and length of the surface of the undulation remote from a feeding section for the sulphur so that molten sulphur is caused to form into a layer and solidify on the belt as it passes through the pool. Cooled or partially cooled sulphur is then delivered from the surface of the belt. The angle of undulation extending upwardly and away from the feeding section is normally within the range of one half a degree to about three degrees. Apparatus for use in the solidification of molten sulphur is also provided. A cooling tank assembly provided with a plurality of generally transversely disposed baffles includes means for directing a supply of air into the assembly with an air deflector embodied in the cooling tank structure.

3,832,146

HIGH PRESSURE HYDROTHERMAL GROWTH OF QUARTZ WITH HIGH "Q" VALUES

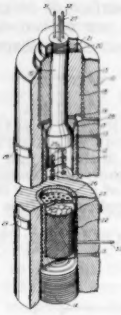
Eileen E. Bresnahan, North Andover, and Nicholas C. Lias, Lowell, Mass., and Ernest D. Kolb, New Providence, and Robert A. Laudise, Berkeley Heights, N.J.; said Eileen E. Bresnahan and said Lias assignors to Western Electric Company, Incorporated, New York, N.Y.; said Kolb and said Laudise assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 16, 1972, Ser. No. 263,568

Int. Cl. B01j 17/04
U.S. Cl. 23—301 R 8 Claims

Hydrothermal growth of high acoustic quartz (Q greater than 10^6) at fast rates of about 100 mils per day

(2.5 mm./da.) is made possible by the utilization of



pressures exceeding 30,000 p.s.i. (2,069 bars) and a growth temperature exceeding 350° C.

3,832,147
COMPOSITE ARTICLE COMPRISING THREE DISSIMILAR METALS

James L. Forand, Jr., Kunkletown, Monroe County, Polk Township, Pa., assignor to Bethlehem Steel Corporation

Continuation-in-part of abandoned application Ser. No. 867,014, Oct, 16, 1969. This application Jan. 18, 1972, Ser. No. 218,802
Int. Cl. B23p *3/06*
U.S. Cl. 29—191 **1 Claim**

A method for producing a composite article having a ferrous substrate and at least one non-ferrous metal, for example, copper or aluminum, clad thereto on one surface or on both surfaces. The method includes cold rolling the substrate and cladding to effect a reduction of about 5%, heating the composite thus formed to a temperature in the range of a minimum of 600° F. and a maximum which is about 100° F. below the temperature at which the clad metal will melt, and rolling the composite within this temperature range to effect a reduction of about 20% to about 50%. The composite may be further reduced to obtain final gage. The product produced by cladding copper and aluminum on the surfaces of a ferrous substrate is also described and claimed.

ERRATUM

For Class 29—191 see:
Patent No. 3,832,136

3,832,148
BIMETALLIC MATERIAL FOR ELECTRONIC TUBE APPLICATIONS

Arnold J. Gottlieb, Colonia, and George A. Majesko, Glen Ridge, N.J., assignors to Wilbur B. Driver Company

No Drawing. Continuation-in-part of application Ser. No. 206,124, Dec. 8, 1971, now Patent No. 3,743,485. This application June 25, 1973, Ser. No. 373,400
Int. Cl. B23p *3/00*
U.S. Cl. 29—195.5 **5 Claims**

A bimetallic material suitable for parts utilized in electronic tubes is disclosed. The material consists essentially of a first metallic alloy element that undergoes a first phase change at a temperature which is below ambient temperature and a second phase change at an elevated temperature which is encountered during electronic tube manufacturing. The first element is metallurgically bonded along a common interface to a second metallic alloy element that does not undergo phase changes within the foregoing temperature ranges. The second element has coefficient of expansion which approximately matches the first element after it has undergone the phase change at the higher temperature. The material is deformed by a predetermined amount to a predetermined pattern to enable a contact to be made with another element of an electronic tube.

3,832,149
GASOLINE COMPOSITION

Robert H. Kozlowski, Berkeley, and Joel W. Rosenthal, El Cerrito, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed June 25, 1971, Ser. No. 163,514
Int. Cl. C10l *1/06*
U.S. Cl. 44—56 **5 Claims**

A motor fuel comprising 1–40 volume percent oxylate and 99–60 volume percent alkylate.

The oxylate consists of tertiary butyl alcohol, isopropyl alcohol, and methyl alcohol. Preferred composition for the oxylate is about 20–90 volume percent tertiary butyl alcohol, 5–40 volume percent isopropyl alcohol, and 5–40 volume percent methyl alcohol.

The alkylate used in the motor fuel composition can be obtained, for example, from sulfuric or hydrofluoric acid alkylation. The oxylate improves the octane of the alkylate gasoline more than expected, and also the oxylate has an unexpectedly high blending octane number in the alkylate over a wide range of percentage amounts of oxylate in the alkylate.

3,832,150
FUEL OIL WITH IMPROVED LOW TEMPERATURE FLOWABILITY

Nicholas Feldman, Woodbridge, N.J., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of abandoned application Ser. No. 760,359, Sept. 17, 1968. This application Oct. 27, 1971, Ser. No. 193,156
Int. Cl. C10l *1/22*
U.S. Cl. 44—62 **7 Claims**

The response of a middle distillate fuel oil, boiling within the range of about 250° to about 670° F. and containing paraffinic constituents, to the addition of a flow-improving additive such as a copolymer of ethylene is improved by adding to the fuel oil from about 1 to about 12 weight percent of a catalytic recycle oil obtained from the catalytic cracking of a petroleum fraction, said recycle oil being a relatively high boiling fraction having a 50 percent atmospheric distillation point within the range of about 660° to about 740° F. and having a final boiling point within the range of about 775° to about 975° F.

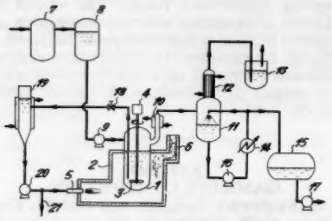
3,832,151
PROCESS AND APPARATUS FOR DISPOSAL OF PLASTIC WASTES

Yoji Kitaoka, Katsuhide Murata, Kotaro Hama, Michio Hashimoto, and Kenji Fujiyoshi, Chiba, Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., and Mitsui Petrochemical Industries Limited, both of Tokyo, Japan

Filed Feb. 28, 1973, Ser. No. 336,473
Claims priority, application Japan, Mar. 18, 1972, 47/27,967
Int. Cl. C10j *3/00;* **F23g** *7/00*
U.S. Cl. 48—111 **4 Claims**

A process for plastic wastes disposal characterized in that plastic wastes are thermally decomposed, the product is cooled and separated into gaseous product and liquid

product, and carbon sludge in the reactor content is dispersed to avoid the deposition of such carbon sludge and

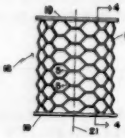


a part of the reactor content is discharged to reduce the carbon sludge in the reactor.

3,832,152
CARBURETION ATOMIZER SCREEN FOR INLET MANIFOLD SYSTEMS

Bohdan Prygrocki, Winnipeg, Manitoba, Canada, assignor to Remsoh Enterprises Ltd., Winnipeg, Manitoba, Canada

Filed June 28, 1972, Ser. No. 267,032
Int. Cl. F02m *29/00*
U.S. Cl. 48—180 C **1 Claim**

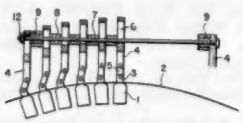


By making a screen of expanded metal through which the air/fuel mixture passes on the way to the intake valve, the angle of inclination of the flat strips which are in the form of a hollow cylinder made of expanded metal is such that far greater atomization and thus far greater intimate mixing of the fuel/air mixture is accomplished than by the use of conventional screen material normally used in an intake manifold system for internal combustion engines.

3,832,153
ADJUSTABLE FORM FOR SHAPING SHEETS OF PLASTIC MATERIAL, IN PARTICULAR, GLASS

Albert Bezombes, Paris, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed May 15, 1972, Ser. No. 253,273
Claims priority, application France, May 14, 1971, 7117490
Int. Cl. C03b *23/02*
U.S. Cl. 65—291 **1 Claim**

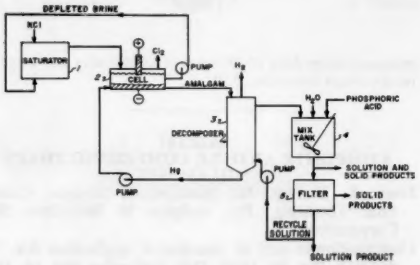


An adjustable form for press-shaping sheets of plastic material such as hot glass, and comprising a plurality of straight bars disposed in parallel, side-by-side relation, each mounted individually for translation with respect to the others. Means are provided for unitizing the bars in desired relation wherein their free surfaces conjointly define or determine a surface of desired form or radius of curvature, usable as one of two complementary forms between which the sheet may be shaped.

3,832,154
PRODUCTION OF CHLORIDE-FREE POTASSIUM PHOSPHATES

Travis P. Hignett, Sheffield, and Anthony J. Smith, Florence, Ala., assignors to Tennessee Valley Authority

Continuation-in-part of application Ser. No. 296,296, Oct. 10, 1972. This application June 18, 1973, Ser. No. 370,980
Int. Cl. C01d *11/00*; C05b *7/00*
U.S. Cl. 71—34 **5 Claims**



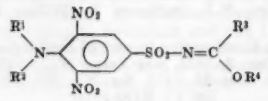
A process for the production of chloride-free potassium phosphate fertilizers, chlorine and hydrogen, including a method of treatment of impure saturated potassium chloride solution wherein a pure or impure brine is electrolyzed at high current efficiency. Chlorine is formed at the anode and potassium amalgam, at the cathode. Said amalgam is subsequently reacted with orthophosphoric acid or polyphosphoric acid solution and water to produce hydrogen and potassium orthophosphate or potassium polyphosphate solution, solids, and solution with solids; or amalgams of other metals, such as sodium, lithium, and zinc are produced at high current efficiency from their respective similarly treated impure chloride brines for subsequent processing.

3,832,155
N-ALKOXYALKYLIDENESULFONAMIDE COMPOUNDS AS HERBICIDES

James R. Beck, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Original application Nov. 3, 1970, Ser. No. 86,619, now Patent No. 3,681,406. Divided and this application Mar. 6, 1972, Ser. No. 232,288
Int. Cl. A01n *9/14*
U.S. Cl. 71—103 **13 Claims**

The present invention is directed to novel compounds of the formula



which compounds are useful as herbicides. In the above and succeeding formulae herein, R^1 represents hydrogen or R^2, and each R^2 independently represents loweralkyl of C_1–C_4, loweralkenyl of C_3–C_4, loweralkynyl of C_3–C_4, or radical of the formula $—CH_2—CH_2(CH_2)_nY$, where-

in *n* represents 0 or 1, and Y represents methoxy, cyano, bromo, or chloro, subject to the limitation that the groups represented by R^1 and R^2 together contain from 2 to 8, both inclusive, carbon atoms; R^3 represents hydrogen, loweralkyl of C_1–C_2, or phenyl; and R^4 represents alkyl of C_1–C_8, allyl, or 2-chloroethyl.

3,832,156

POWDERED METAL PROCESS

Stanmore V. Wilson, Princeton, and Paul E. Matthews, Trenton, N.J., assignors to United States Bronze Powders, Inc.

No Drawing. Filed Sept. 27, 1972, Ser. No. 292,734

Int. Cl. B22f *1/00*

U.S. Cl. 75—0.5 B **20 Claims**

Malleable metal powders having low green strength can be converted to high green strength, irregularly shaped particles according to a process comprising mechanically working, as by ball milling, the low green strength powders to flake form, annealing the flakes above the recrystallization temperature thereof in a non-oxidizing atmosphere to agglomerate the flake particles into a sinter cake susceptible of subsequent break-up and mechanically disintegrating the sinter cake into the irregularly shaped particles. According to this process, blends of low green strength spherical elemental powders may be converted to high green strength, high transverse strength, high hardness alloy particles.

3,832,157

METHOD OF PRODUCING REFRACTORY METALS AND REFRACTORY METAL COMPOUNDS IN POWDER FORM

Elis Kjell Ake Svanstrom, Nynashamn, Sweden, assignor to Rederiaktiebolaget Nordstjernan, Nynashamn, Sweden

No Drawing. Original application May 21, 1971, Ser. No. 145,922, now Patent No. 3,723,601. Divided and this application Oct. 30, 1972, Ser. No. 302,117

Int. Cl. C22b *39/00, 51/00, 57/00*

U.S. Cl. 75—.5 BB **1 Claim**

Refractory metals are produced using a gaseous halide process in which the process is accelerated by employing crystallization seeds in the reaction.

3,832,158

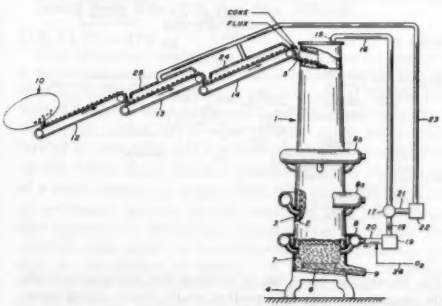
PROCESS FOR PRODUCING METAL FROM METAL OXIDE PELLETS IN A CUPOLA TYPE VESSEL

Richard F. Obenchain, 3340 Comanche Road, Pittsburgh, Pa. 15234

Filed May 31, 1973, Ser. No. 365,503

Int. Cl. C21b *13/00*

U.S. Cl. 75—38 **15 Claims**



Metal is produced from metal oxide in a cupola-type vessel by the reduction of carbon-containing metal oxide pellets. Following formation of a coke bed in a cupola-type vessel, alternate layers of metal oxide pellets, the pellets containing sufficient carbon to reduce the metal oxide of the pellet, and layers of coke are fed to the cupola-type vessel. Flux material is also added and, upon ignition of the coke bed, the metal oxide pellets are reduced in a self-contained system. The coke bed and the coke added to replenish the bed in alternate layers are used for the supplying of heat to the metal oxide carbon-containing pellets to initiate the reduction of the metal oxide therein, with the metal oxide reducing to molten metal which is then passed through the ignited coke bed, collected, and withdrawn from the cupola-type vessel at predetermined intervals or continuously. The carbon content of the resulting molten metal can be controlled by enriching the air fed to the coke bed with oxygen, with the oxidation of impurities and carbon being effected to produce a controlled carbon content metallic product.

3,832,159

PROCESS FOR MONITORING AND CONTROLLING THE SEQUENCE OF REACTIONS IN A BASIC OXYGEN STEEL PRODUCTION PROCESS

Erich Höffken, Dinslaken, and Gerd Kreyss, Breitscheid, near Dusseldorf, Germany, assignors to August Thyssen-Hutte, Dusseldorf, Germany

Filed Dec. 8, 1971, Ser. No. 206,087

Int. Cl. C21c *7/00*; G01m *3/04*

U.S. Cl. 75—60 **2 Claims**

An oxygen blow lance for a metal refining process carries a lever pivotably attached to an outer tube of the lance and guidably attached for displacement along an inner tube of the lance, the lever undergoing pivotal movement in proportion to relative longitudinal displacement of the tubes during the refining process. The lever carries a plunger which cooperates with an induction coil fixed to the outer tube to produce an electrical signal indicative of the relative longitudinal displacement between the tubes. The electrical signal is fed to a recorder where the relative longitudinal displacement between the tubes is plotted as a function of time to produce a curve from which the sequence of reactions can be observed.

3,832,160

DECARBURIZING MOLTEN STEEL

Harry L. Bishop, Jr., Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of abandoned application Ser. No. 864,279, Sept. 30, 1969. This application Dec. 30, 1971, Ser. No. 214,446

Int. Cl. C21c *5/32*

U.S. Cl. 75—60 **22 Claims**

The application describes a method for decarburizing molten steel. It comprises the steps of introducing oxygen into a vessel containing a liquid bath of metal, in a manner which precipitates a reaction between carbon within the metal and oxygen, analyzing the gases exiting from the vessel, determining whether the lance is submerged from the analysis of the exiting gases, and lowering the lance responsive to the gas analysis should it not be submerged, so that oxygen is only being introduced by submerged means.

3,832,161

METHOD OF BLOWING-IN THROUGH BLAST PIPES SUBMERGED IN A METALLIC BATH

Pierre Leroy, Saint-Germain-en-Laye, France, assignor to Creusot-Loire, Paris, France

Filed July 18, 1972, Ser. No. 272,878

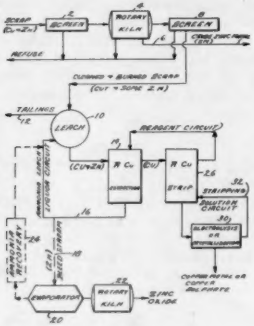
Int. Cl. C21c *5/34*

U.S. Cl. 75—60 **8 Claims**

A metallic bath is refined by blowing oxygen into the bath by submerged blast pipes. A primary jet is centered in each blast pipe for a gas containing droplets in suspen-

sion to reduce or suppress metallic oxide fumes otherwise produced in the bath by the oxygen.

3,832,162
RECOVERY OF COPPER AND ZINC FROM AUTOMOBILE SCRAP
Edwin D. Smith, 1951 Wallace Road, Allison Park, Pa. 15101
Filed Mar. 26, 1969, Ser. No. 810,670
Int. Cl. C22b *13/04, 15/10*
U.S. Cl. 75—63 **10 Claims**

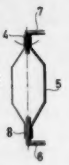


Copper and zinc are recovered from scrap derived from automobiles by first removing the bulk of the ferrous materials, burning the organic material, separating the bulk of the zinc as liquid metal, contacting the residue with aqueous ammonia to leach out the copper and residual zinc, treating the ammoniacal solution with a water immiscible organic liquid containing a copper specific ion exchange reagent to separate the copper from the zinc, stripping the organic copper containing solution with aqueous liquid, and recovering the separated copper and zinc.

3,832,163
PROCESS FOR CONTINUOUS SMELTING AND CONVERTING OF COPPER CONCENTRATES
Nicholas John Themelis, Beaconsfield, Quebec, and George Clement McKerrow, Noranda, Quebec, Canada, assignors to Noranda Mines Limited, Toronto, Ontario, Canada
Filed Aug. 13, 1971, Ser. No. 171,705
Claims priority, application Canada, Feb. 1, 1971, 104,111
Int. Cl. C22b *15/00*
U.S. Cl. 75—74 **16 Claims**

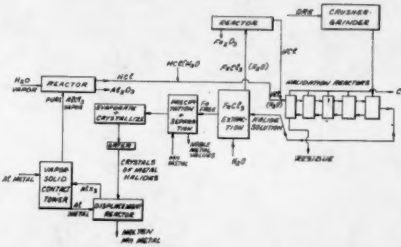
A process for the continuous smelting and converting of copper concentrates to metallic copper involves charging concentrates into a reactor which is maintained at a temperature at which a molten bath of slag, matte and metallic copper is formed. An oxidizing gas is injected into the molten bath and the charge of the concentrates is controlled in balanced relationship to an injection control rate of the gas such that the gas is sufficient to oxidize substantially all significant iron and sulphur in the concentrate so that smelting and converting is effected in the same zone of the reactor. The injection of the gas is such as to maintain a turbulent state of the molten bath and produce metallic copper. Slag and metallic copper are withdrawn from the reactor. The apparatus used for carrying out the process embodies a charging port, injection means, a copper settling area and a sump in the base thereof. Control means are provided for the oxidizing gas and means are also provided to control the introduction of concentrates through the charging port. Interlocking control means are adapted to control the introduction of oxidizing gas and the introduction of concentrates in a desired balanced relationship.

3,832,164
PRODUCTION OF ALUMINUM AND ITS ALLOYS
László Kapolyi, Budapest, and Ferenc Kaszanitzky, Ferenc Lázár, and György Vámos, Tatabanya, Hungary, assignors to Tatabanyai Szenbanyak, Tatabanya, Hungary
Filed Mar. 29, 1971, Ser. No. 128,870
Claims priority, application Hungary, Apr. 2, 1970, TA–1,053
Int. Cl. C22b *21/02*
U.S. Cl. 75—68 B **5 Claims**



A process is disclosed whereby aluminum and its alloys is produced from oxidic materials, e.g. coal slag or other low-grade aluminum-containing materials, by mixing carbon with the starting material in an amount in excess of that required for reducing the oxides. A melt is then formed of said material which is applied and maintained over the wall surface of a reaction zone in the form of a continuous protective coating while contacting the melt with aluminum trihalogenide gases at a temperature above 1300° C. This coating inhibits the corrosion of said wall surface. The aluminum subhalogenide gases which form in the reaction zone are removed, condensed at a temperature between 600 and 1000° C., and metallic aluminum and alloys thereof are recovered from the condensate.

3,832,165
PROCESS FOR RECOVERING MANGANESE FROM ITS ORE
William S. Kane, Wicomic, and Paul H. Cardwell, Zanoni, Va., assignors to Deepsea Ventures, Inc.
Filed Feb. 28, 1973, Ser. No. 336,547
Int. Cl. C22b *47/00*
U.S. Cl. 75—80 **19 Claims**



This invention provides a process for obtaining high purity manganese, in the molten state, from manganese oxide ores containing iron. The process comprises halidating the ore with a hydrogen halide and leaching to obtain a leach solution comprising manganous and ferric halides and the elemental halogen; extracting the ferric halide

from the solution; separating anhydrous manganese halide from the solution; reducing the anhydrous manganese halide in the molten state with aluminum to form molten manganese metal and aluminum halide; reacting the aluminum halide with water vapor to form hydrogen halide and aluminum oxide; and recycling the hydrogen halide.

Usually, where the ore also contains a nonferrous metal more noble than manganese, the halide of such nonferrous metal is removed from the leach solution, after the ferric halide is removed, by precipitation.

3,832,166

STEEL SHEET HAVING EXCELLENT RUST RESISTANCE

Hideya Okada, Yokohama, and Haruo Shimada and Kazuo Yamamoto, Tokyo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

No Drawing. Filed Nov. 30, 1972, Ser. No. 310,846
Claims priority, application Japan, Dec. 4, 1971, 46/97,572
Int. Cl. C22c *39/54*
U.S. Cl. 75—125 **1 Claim**

A steel having excellent rust resistance comprising 0.001 to 0.15% of carbon, 0.01 to 1.0% of silicon, 0.01 to 1.0% of manganese, 0.01 to 0.5% of copper, 0.003 to 0.3% of sulfur and titanium in an amount enough to attain a Ti/S ratio of 2 or more, with the balance being iron and unavoidable impurities.

3,832,167

NICKEL ALLOY WITH GOOD STRESS-RUPTURE STRENGTH

Stuart Walter Ker Shaw, Sutton Coldfield, and Nigel Anthony James, Birmingham, England, assignors to The International Nickel Company, Inc., New York, N.Y.

No Drawing. Filed Feb. 22, 1972, Ser. No. 228,294
Claims priority, application Great Britain, Feb. 23, 1971, 5,225/71
Int. Cl. C22c *19/00*
U.S. Cl. 75—170 **4 Claims**

A hardenable nickel alloy containing special percentages of chromium, aluminum, titanium, hafnium, yttrium, molybdenum, tungsten, carbon, etc., offers enhanced stress rupture strength over the intermediate temperature range of 600° C.–900° C. while retaining a satisfactory level of ductility.

3,832,168

METAL FINISHING ALLOY OF NICKEL-COPPER-PHOSPHORUS

Michael Gulla, Newton, Mass., assignor to Shipley Company, Inc., Newton, Mass.

Continuation-in-part of abandoned application Ser. No. 207,697, Dec. 13, 1971, which is a division of abandoned application Ser. No. 119,661, Mar. 1, 1971. This application June 21, 1973, Ser. No. 372,430
Int. Cl. C22c *19/00*
U.S. Cl. 75—170 **6 Claims**

This invention relates to a new metal coating useful as a protective and decorative finish which finish also has unusual functional properties and to a metal plating solution capable of depositing said coating. The coating is an electroless nickel copper-phosphorus alloy substantially free of co-deposited sulfur which coating is deposited from an electroless nickel solution characterized by the presence of a small amount of copper ions. The copper ions provide an extremely smooth deposit resulting in a lustrous surface appearance. Moreover, copper ions in the monovalent cuprous state, added to the electroless nickel solution, provide the secondary advantages of stabilizing the plating solution and substantially improving corrosion resistance of the deposit. Copper ions in either the monovalent cuprous state or the divalent cupric state added to the electroless nickel solution co-deposit with the nickel providing the electroless alloy deposit of nickel, phosphorus and copper.

3,832,169

METHOD OF ELECTROPHOTOGRAPHY WITH A PHOTOCONDUCTIVE LAYER MANIFESTING PERSISTENT INTERNAL POLARIZATION

Koichi Kinoshita, Narashino, and Shiro Uehara and Hiroshi Nagame, Tokyo, Japan, assignors to Katsuragawa Denki Kabushiki Kaisha, Tokyo-to, Japan

Continuation of abandoned application Ser. No. 798,647, Feb. 12, 1969. This application Sept. 28, 1971, Ser. No. 184,638
Claims priority, application Japan, Feb. 14, 1968, 43/9,254
Int. Cl. G03g *5/02*
U.S. Cl. 96—1 R **8 Claims**

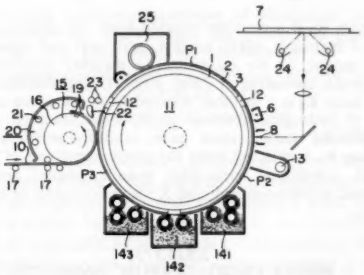
A method of electrophotography comprising the step of applying a first field across a photosensitive element including a transparent highly insulative layer and a photoconductive layer manifesting persistent internal polarization integrally bonded to the highly insulative layer to deposit an electric charge of a first polarity opposite to that of the majority carriers of the photoconductive layer on the surface of the highly insulative layer. An image of a screen is projected upon the photoconductive layer from the side of the photosensitive element opposite the highly insulative layer concurrently with the application of the first field. The screen may be integral with or separate from the photosensitive element. The photoconductive layer has a thickness such that light portions of the screen image do not cause substantial excitation of the photoconductive layer on the side adjacent the insulative layer. A second field is applied across the photosensitive element to deposit an electric charge of polarity opposite to the first polarity on the suruface of the highly insulative layer and a light image is projected upon the photoconductive layer through the highly insulative layer concurrently with the application of the second field whereby to form a latent image corresponding to the light image on the surface of the highly insulative layer.

3,832,170

METHOD AND APPARATUS FOR ELECTRONIC COLOR PHOTOGRAPHY AND PHOTOSENSITIVE MEMBER USED FOR THE SAME

Katsumi Nagamatsu and Takashi Saito, Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 1, 1970, Ser. No. 24,734
Int. Cl. G03g *5/04, 13/22*
U.S. Cl. 96—1.2 **14 Claims**



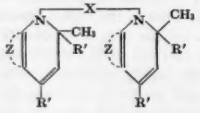
The photosensitive member consists basically of a supporting base, a photoconductive layer and an insulating layer dyed in a desired color for providing a color filter effect. Such photosensitive members having different color filter effects are provided for polychromatic reproduction on a single transferable material.

3,832,171
RECORDING PROCESS AND ELEMENT EMPLOYING AS PHOTOCONDUCTIVE MATERIAL DUPLO - DIHYDROQUINOLINE COMPOUNDS

Wilhelmus Janssens, Aarschot, Johannes Josephus Vanheertum, Zandhoven, Albert Lucien Poot, Kontich, and Robert Joseph Pollet, Vremde, Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

No Drawing. Filed Dec. 10, 1971, Ser. No. 206,872
Claims priority, application Great Britain, Dec. 11, 1970, 59,094/70
Int. Cl. G03g 5/06
U.S. Cl. 96—1.5 29 Claims

Photoconductive elements containing a monomeric organic photoconductive compound corresponding to the following general formula:



wherein:

Z represents the necessary atoms to close an adjacent aromatic nucleus or ring system,

R′ represents a (C_1–C_4) alkyl radical, and

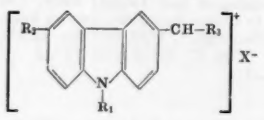
X represents an alkylene group, or an alkylene chain interrupted by bivalent aromatic group, are described. The described photoconductors can be chemically and spectrally sensitized and charged either negatively or positively.

3,832,172
PHOTOSENSITIVE MATERIAL FOR ELECTROPHOTOGRAPHY

Katsuhiko Nishide, Yokohama, Teruo Yamanouchi, Fujisawa, and Kikuo Kinjo, Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1972, Ser. No. 318,886
Int. Cl. G03g 5/06
U.S. Cl. 96—1.6 3 Claims

A photosensitive material for electrophotography comprises an organic photoconductive material and a diarylmethane type coloring matter having the formula



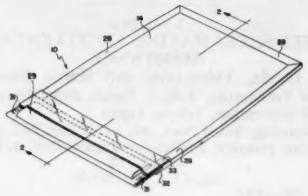
wherein R_1 is a member selected from the group consisting of hydrogen, alkyl, aralkyl, aryl, acyl and substituted aryl having, as the substituent, a member selected from the group consisting of alkyl, alkoxyl, dialkylamino, nitro and halo; R_2 is a member selected from the group consisting of hydrogen, hydroxy, alkyl, aroyl, alkoxyl, amino, substituted amino, nitro, halo, aryloxy, acyl aryl, and cyano; R_3 is selected from the group consisting of carbazolyl, substituted carbazolyl, p-anilinophenyl and substituted p-anilinophenyl; and X^- is an inorganic or organic anion.

3,832,173
NOVEL PHOTOGRAPHIC PRODUCTS AND PROCESSES

Leon D. Cerankowski, Carlisle, and Neil Mattucci, Billerica, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 12, 1972, Ser. No. 314,405
Int. Cl. G03c 7/00, 5/54, 1/40, 1/10
U.S. Cl. 96—3 32 Claims

The present invention relates to specified solid material dispersions, particularly to photographic film units employing such dispersions and, more particularly, to diffusion transfer process photographic film units which comprise a photosensitive element adapted to provide, by diffusion transfer photographic processing, selective dye image recordation of incident actinic radiation as a function of the point-to-point degree of photosensitive element exposure, which film unit includes a plurality of essential layers including a photosensitive silver halide



layer having associated therewith diffusion transfer process dye image-forming material disposed in the unit as a solid dispersion formulated in accordance with the present invention, a layer adapted to receive dye image-forming material diffusing thereto; and to specified processes for the production of and the employment of the dispersions including photographic processes such as diffusion transfer photographic processes employing film units containing such dispersions.

3,832,174
PHOTOGRAPHIC PROCESSES AND ELEMENTS

Hobson Joseph Bello, Jr., and Albert Charles Smith, Jr., Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 7, 1972, Ser. No. 260,617
Int. Cl. G03c 7/16, 7/32, 7/40
U.S. Cl. 96—22 10 Claims

Processes for providing photographic reproductions wherein silver negative images are developed in imagewise exposed photographic elements having at least two superposed hydrophilic colloid emulsion image recording layers containing silver halide and color forming couplers wherein at least one of the silver halide emulsion image recording layers contains from about 0.5 to 10 mole percent iodide, based on the total amount of halide in the emulsion layer. Development of the imagewise exposed negative photographic elements in a photographic color developer containing a silver halide solvent and removal of silver and silver halide from said negative elements result in color negatives having improved interimage characteristics.

3,832,175
AROMATIC COMPOSITIONS FOR TREATING SILVER IMAGES

Rodney J. Kemp, London, England, assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Sept. 7, 1972, Ser. No. 287,197
Claims priority, application Great Britain, Sept. 12, 1971, 42,274/71
Int. Cl. G03c 5/54; G03f 7/02
U.S. Cl. 96—29 L 21 Claims

A composition for treating a silver image, such as that obtained by the photographic silver salt diffusion transfer process on a hydrophilic surface, comprises an acidic aqueous solution containing:

(a) a long chain organic aromatic cationic compound, such as a long chain organic quaternary ammonium compound, or a long chain organic sulphonium compound,

(b) iodide ions, and
(c) a heterocyclic organic compound which has a nitro group bonded to an aromatic nucleus, such as 1-(2',4'-dinitrophenyl) pyridinium chloride, or an organic cationic compound having an aromatic group but no nitro group.

A printing plate comprising a hydrophilic surface having a silver image thereon which has been treated with this composition, and a process for preparing said plate comprising contacting a silver image on a hydrophilic surface with this composition, are taught.

3,832,176

NOVEL PHOTORESIST ARTICLE AND PROCESS FOR ITS USE

Jerome A. Verstraete, John M. Noonan, and Richard W. Neubert, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 6, 1973, Ser. No. 348,579

Int. Cl. G03c *1/76*

U.S. Cl. 96—67 **19 Claims**

An article is disclosed having an insulative support on which is positioned an etchant destructible plating layer having a thickness of less than 10,000 Angstroms and, preferably, less than 5,000 Angstroms. A photoresist layer overlies the plating layer. A protective layer can overlie the photoresist layer. Unexposed areas of the photoresist layer are capable of being removed by a non-etching solvent to leave the plating layer substantially micro-residue free. This permits plating a metal layer over the uncovered portions of the thin plating layer without employing a cleaning etchant capable of destroying or damaging the plating layer. The plated metal layer can be electroplated or electrolessly deposited onto the plating layer to form a tenaciously adherent coating.

3,832,177

PROCESS FOR THE PREPARATION OF PRINTING PLATE OF PHOTOSENSITIVE RESIN

Kiyoshi Akamatsu, Tokyo, Masayasu Maruta, Ohi, and Yasushi Yonekura, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Original application June 12, 1970, Ser. No. 45,745, now Patent No. 3,687,785. Divided and this application June 14, 1972, Ser. No. 262,826

Claims priority, application Japan, June 16, 1969, 44/46,817

Int. Cl. G03c *5/00*

U.S. Cl. 96—35.1 **1 Claim**

An apparatus for the preparation of a printing plate comprising a layer of photo-sensitive liquid resin, wherein the improvement comprises an application means for laminating an anti-wrinkle plastic sheet on the resin surface upon being doctored and at the same speed with that of the doctor.

3,832,178

FILM DEVELOPING PROCESS

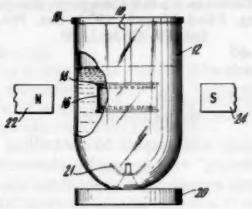
Max Jacobson, 56 E. 87th St., New York, N.Y. 10028

Continuation-in-part of applications Ser. No. 142,396 and 142,413, both dated May 11, 1971, both now abandoned. This application May 3, 1973, Ser. No. 356,791

Int. Cl. G03c *5/24, 5/26*

U.S. Cl. 96—50 R **7 Claims**

The quality of silver halide images is enhanced and/or film developing time reduced by the relative displacement of developer to film in the presence of a magnetic field. A feature of the invention is also disclosed in which during



the development process enzymes are added, thereby enhancing still further the images and/or film developing speed.

3,832,179

INHIBITION OF FOG IN PHOTOGRAPHIC COLOR DEVELOPMENT

Charles O. Edens, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 24, 1973, Ser. No. 326,353

Int. Cl. G03c *7/00*

U.S. Cl. 96—56 **10 Claims**

In processing multilayer color photographic elements the formation of fog is suppressed by carrying out the development of the element in a color developer solution containing a nitro-substituted benzoic acid, such as 3,5 - dinitrobenzoic acid. The nitro - substituted benzoic acid functions effectively to suppress magenta and yellow fog and, to a lesser extent, to suppress cyan fog.

3,832,180

PHOTOGRAPHIC MATERIAL

David Ramsay Douglas, 23 Roden St., Ilford, Essex, England

No Drawing. Continuation-in-part of abandoned application Ser. No. 49,993, June 25, 1970. This application Oct. 12, 1971, Ser. No. 188,464

Claims priority, application Great Britain, June 30, 1969, 32,955/69

Int. Cl. G03c *1/06, 1/48, 5/30*

U.S. Cl. 96—66.3 **5 Claims**

This application describes a process for the production of developed photographic material which comprises subjecting photographic lith material containing a latent silver image in a silver halide emulsion layer to development by means of a formaldehyde/bisulphite/hydroquinone lithographic developer, the process being characterized in that the development takes place in the presence of a water-soluble polyethylene oxide chain $+CH_2CH_2O+_n$ where n is an integer from 5–200 and an organic mercapto compound selected from dialkyl substituted thioureas and heterocyclic nitrogen compounds containing a mercapto group attached to a carbon atom which is in the alpha position with respect to a nitrogen atom in the heterocyclic ring.

3,832,181

PHOTOSENSITIVE SILVER HALIDE MATERIAL CONTAINING A HYDROPHILIC COLLOID HARDENED WITH A COMBINATION OF FORMALDEHYDE AND BIS(VINYLSULFONYL-METHYL)ETHER

Dale S. Dallon and Mary K. Deseyn, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 7, 1973, Ser. No. 358,237
Int. Cl. G03c 1/30
U.S. Cl. 96—67 5 Claims

Certain blends of

(a) formaldehyde, plus
(b) bis(vinylsulfonylmethyl)ether

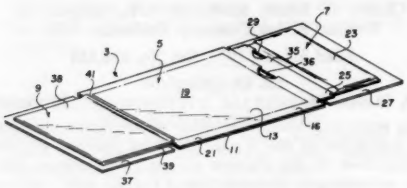
exhibit synergism with respect to controlling beneficially the "afterhardening" this is usually observed when, for example, gelatin-containing compositions are chemically hardened. The hardened gelatin compositions are particularly useful as emulsion layers in photographic elements.

3,832,182

FILM UNIT

John A. Mathews, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 7, 1971, Ser. No. 178,235
Int. Cl. G03c 1/48
U.S. Cl. 96—76 C 17 Claims



A photographic film unit of the self-processing type, including an image-recording portion, and means in communication with the image-recording portion for accommodating a processing fluid. The accommodating means preferably includes a fluid supply mechanism, such as a pod, and a collecting mechanism, such as a trap, that initially extend outwardly from the leading and trailing ends of the image-recording portion, respectively, but that are foldable to positions behind a print-viewing side of the recording portion after processing has been initiated. Such folding improves the appearance of the processed film unit without generating any necessarily disposable waste. The foldable portions are substantially flat when folded and, in accordance with one feature, are approximately equal in combined area to the area of the image-recording portion, to evenly cover the entire side of the image-recording portion opposite from the print-viewing side.

3,832,183

POLYMER ENCAPSULATED SILVER HALIDE GRAINS

Howard G. Rogers, Weston, and Lloyd D. Taylor, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Original application Feb. 17, 1971, Ser. No. 115,985, now Patent No. 3,697,279. Divided and this application May 4, 1972, Ser. No. 250,357
Int. Cl. G03c 1/40, 1/02, 1/10, 1/72, 1/28
U.S. Cl. 96—77 16 Claims

This invention is directed to microscopic capsules comprising a continuous synthetic polymeric layer surrounding a nucleus composed of photosensitive silver halide grains wherein the polymeric layer is of sufficient thickness to substantially overcome the attractive forces of said silver halide grains for adjacent silver halide grains. Thus, the present invention contemplates individual grains of photosensitive silver halide which are spatially separated from adjacent grains by means of a polymeric layer encasing the grains. The present invention is also directed to methods for providing such encapsulated products and to photographic products employing said capsules.

3,832,184

FOGGED DIRECT POSITIVE SILVER HALIDE EMULSION CONTAINING A CYANINE DYE HAVING A 2-ALIPHATIC, CHLORINE, OR HYDROGEN-SUBSTITUTED INDOLE NUCLEUS

Akira Sato, Tadashi Ikeda, Akira Ogawa, Keisuke Shiba, and Masanao Hinata, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Dec. 26, 1972, Ser. No. 318,047
Claims priority, application Japan, Dec. 24, 1971, 46/935
Int. Cl. G03c 1/08, 1/28, 1/36
U.S. Cl. 96—101 20 Claims

Direct positive silver halide emulsions which contain at least one dimethinecyanine dyes in which the 3-position of the indole nucleus having a hydrogen atom, chlorine atom, lower alkyl group, carboxyl group or lower alkoxycarbonyl group in the 2-position thereof joins to the 1-, 2-, 3- or 4-position of the cyanine heterocyclic nucleus through a dimethine chain, with the proviso that only when the cyanine nucleus is isoquinoline is the joining to the 1- or 3-position, and when joining is to the 4-position, the cyanine nucleus comprises a quinoline or pyridine ring.

3,832,185

SYNTHETIC SILVER HALIDE EMULSION BINDER

Maurice J. Fitzgerald, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Jan. 2, 1973, Ser. No. 320,448
Int. Cl. G03c 1/72
U.S. Cl. 96—114 29 Claims

A photosensitive silver halide emulsion wherein the emulsion binder comprises a quaternary ammonium acrylate carboxybetaine polymer or copolymer.

3,832,186

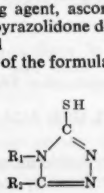
HEAT DEVELOPING-OUT PHOTOSENSITIVE MATERIALS

Takao Masuda, Kinji Ohkubo, and Tadao Shishido, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

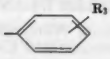
No Drawing. Filed Apr. 26, 1973, Ser. No. 354,584
Claims priority, application Japan, Apr. 26, 1972, 47/41,967
Int. Cl. G03c 1/72, 1/34
U.S. Cl. 96—114.1 30 Claims

Heat developing-out photosensitive materials consisting of the following components:

(a) a support, and
(b) a layer comprising the following ingredients:
  (1) silver benzotriazole,
  (2) a silver halide obtained by the reaction of silver benzotriazole and an inorganic halide,
  (3) as a reducing agent, ascorbic acid, a derivative thereof or a 3-pyrazolidone derivative,
  (4) a binder, and
  (5) a compound of the formula



wherein R_1 represents hydrogen or an alkyl group or a group of the formula



R_2 represents an alkyl group or a group of the formula

and R_3 stands for hydrogen or an amino group or a group of the formula

$$-NH-\overset{\overset{O}{\|}}{C}-R_4$$

and R_4 stands for an alkyl group.

3,832,187

SINGLE-PHASE FILM-FORMING PHOTO-CROSS-LINKABLE SYSTEMS

Wolfgang Kleeberg, Erlangen, Roland Rubner, Rottenbach Uber Forchheim, and Eberhard Kuehn, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

No Drawing. Filed June 20, 1972, Ser. No. 264,569
Claims priority, application Germany, June 22, 1971, P 21 30 904.6
Int. Cl. G03c *1/68*
U.S. Cl. 96—115 R **7 Claims**

A single-phase, solid film-forming photo-cross-linkable resinous system comprised of a component containing allyl-ester groups and a component containing one or several N-maleic imide groups with a ratio of the allyl double bond equivalent to the maleic imide double bond equivalent equal to or greater than 1. The resinous systems are especially useful as compositions for use in photoprinting applications, for example, as in production of printed circuits.

3,832,188

PHOTOSENSITIVE POLYAMIDE COMPOSITIONS

Yasuo Bamba, Kyoto, and Masao Iwamoto, Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

No Drawing. Filed Aug. 14, 1972, Ser. No. 280,484
Claims priority, application Japan, Feb. 29, 1972, 47/20,133
Int. Cl. C03c *1/70*
U.S. Cl. 96—115 P **8 Claims**

A photosensitive polyamide composition consisting essentially of

(I) about 40–90% by weight of an alcohol soluble linear polyamide,

(II) about 10–60% by weight of a photopolymerizable unsaturated compound having at least one group selected from the group consisting of

$$-N(CH_2CH(OH)CH_2OCOCR''=CH_2)_2$$

and

$$-NR'CH_2CH(OH)CH_2OCOCR''=CH_2$$

wherein R′ and R″ are members selected from the group consisting of hydrogen and a hydrocarbon group having 1 to 12 carbon atoms,

(III) about 0.01–10% by weight of a phosphorous compound having the formula

wherein R_1 is phenyl or its derivatives and R_2 and R_3 are members selected from the group consisting of alkyl, aryl and aralkyl having 1 to 15 carbon atoms.

3,832,189

SILVER HALIDE PHOTOGRAPHIC SUPER-SENSITIZED EMULSIONS

Keisuke Shiba, Masanao Hinata, Akira Sato, Akira Ogawa, and Takashi Ikeda, Kanagawa, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Nov. 24, 1972, Ser. No. 309,531
Claims priority, application Japan, Nov. 24, 1971, 46/94,266
Int. Cl. G03c *1/14*
U.S. Cl. 96—124 **17 Claims**

A green-sensitive silver halide photographic emulsion for color photographic materials super-sensitized by a combination of a specific benzimidazolo oxacarbocyanine dye and a specific oxacarbocyanine dye.

3,832,190

ANTI-FOULING PAINT FOR SHIP'S BOTTOM AND STRUCTURES UNDER SEA WATER

Hiroshi Fujimura, Osaka, Yoshio Nose, Hiroshima, and Teiichi Kanazawa, Shimizu, Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

No Drawing. Continuation of abandoned application Ser. No. 64,958, Aug. 19, 1970. This application June 2, 1972, Ser. No. 259,344
Int. Cl. C09d *5/14, 5/16*
U.S. Cl. 260—15 AF **11 Claims**

An anti-fouling paint for ship's bottom and structures under sea water comprises an effective amount for controlling sea organisms of a tin compound having the general formula

$$R_3SnO\overset{\overset{O}{\|}}{C}-R'-\overset{\overset{O}{\|}}{C}OSnR_3$$

wherein R is an alkyl or a phenyl radical and R′ is a halogenated ethylene or a halogenated phenylene radical, and a coating film forming material.

3,832,191

SILICATE BONDED FOUNDRY MOLD AND CORE SANDS

Donald B. Bolding and Hilton S. Williams, Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

No Drawing. Filed Sept. 20, 1972, Ser. No. 290,721
Int. Cl. B28b *7/34*
U.S. Cl. 106—38.3 **26 Claims**

Mixtures of a refractory material with an alkali metal silicate and humic acid produce a foundry sand composition for use in making molds and cores which is re-useable upon breaking up, re-milling and re-wetting the used molds and which is re-useable upon re-wetting and re-milling dried out sand. A unique foundry sand binder comprising a solid, water-soluble alkali metal silicate and humic acid is also disclosed.

3,832,192

CERAMIC DIELECTRIC PORCELAINS

Charles Michael McIntosh, Cold Spring, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 855,731, Sept. 5, 1969. This application Aug. 6, 1971, Ser. No. 169,813
Int. Cl. C04b *33/26;* **H01g** *3/135*
U.S. Cl. 106—46 **1 Claim**

Production of sintered ceramic porcelain dielectrics having a predominant spinel phase and air sintered between 800–900° C. from a green sheet providing uniform dielectric properties and compressibility for lamination of stacked green sheets into a unitary laminate which may be provided with internal patterns of electrical conductors extending therein. The structure is obtained by blending the ceramic particulate with a suitable glass and low temperature firing or sintering the composition between said 800–900° C. Densification of the green module and metallization, glass bead sealing of the pins, and hardening of the pins by oxidation were accomplished in a single air-cofiring in the above temperature range.

3,832,193

REFRACTORY COMPOSITIONS CONTAINING DIAMMONIUM PHOSPHATE

Joseph R. Parsons, Park Forest, and Harold L. Rechter, Chicago, Ill., assignors to Chicago Fire Brick Company, Chicago, Ill.

No Drawing. Filed Feb. 25, 1972, Ser. No. 229,571

Int. Cl. C04b 35/10, 35/18

U.S. Cl. 106—65 10 Claims

A refractory composition comprising refractory particles, water, diammonium phosphate and an acid or acid salt mixed therewith in amount to give a pH below 7.0 and not less than 3.0, the refractory particles including alumina, bentonite, clay and bauxite; the acid including phosphoric acid, sulfuric, acetic and citric acids, and the acid salt including monoaluminum phosphate and aluminum sulfate. The compositions, by varying proportions and water content, may be used as ramming, gunning and patching mixes, mortar, and for plastic, brick, block and the like. They form phosphate bonded refractory products capable of high temperature service.

3,832,194

BINDER FOR HIGH ALUMINA REFRACTORY BRICK

Stanley Ronald Pavlica, Irwin, and Ernest Paul Weaver, Pittsburgh, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

No Drawing. Filed Mar. 2, 1973, Ser. No. 337,326

Int. Cl. C04b 35/10

U.S. Cl. 106—65 6 Claims

A non-basic refractory brick with a binder consisting essentially of either chromium lignosulfonate or aluminum lignosulfonate.

3,832,195

PETALITE - SPODUMENE - POTASSIUM SILICATE CEMENT FOR BONDING METAL TO GLASS

Miles F. Butler, 67 Perry Ave., Corning, N.Y. 14830, and John T. Corcia, 43 Tall Meadow Spring Pond, Painted Post, N.Y. 14870

Filed June 16, 1972, Ser. No. 263,683

Int. Cl. C04b 35/16

U.S. Cl. 106—74 2 Claims

This invention is concerned with the production of a cement which is singularly suitable for bonding metal to glass. More particularly, this invention provides a cement consisting essentially of petalite, spodumene, and potassium silicate which is quick setting at ambient temperatures, exhibits good green and fired strength, and is capable of being used at temperatures up to 800° C. with no apparent degradation.

3,832,196

HIGH TEMPERATURE, LOW DENSITY CEMENT COMPOSITION

Pat J. Broussard, Shreveport, La., and Arnold Fincher, Laurel, Miss., assignors to Halliburton Company, Duncan, Okla.

No Drawing. Filed Jan. 24, 1972, Ser. No. 220,439

Int. Cl. C04b 7/12

U.S. Cl. 106—89 12 Claims

An oil well cementing composition consisting essentially of a hydraulic cement, a pozzolanic material, and calcium hydroxide.

3,832,197

HARDENING-RELEASE OF CROSSLINKING IONS FROM A COMPLEX IN AN EMULSION

Joseph De Witt Overman, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 26, 1971, Ser. No. 192,567

Int. Cl. C08f 45/24; C09h 7/00

U.S. Cl. 106—125 4 Claims

Polymeric emulsions are hardened by crosslinking with multivalent cations that are initially present in the emulsions in the form of complexes with complexing agents. Hardening of the emulsions occurs when the crosslinking cations are released from the complexes, e.g., by displacement with other cations.

3,832,198

GELATIN COMPOSITION CONTAINING A HALOMETHYL KETONE OF BENZYLOXYCARBONYL PHENYLALANINE

Elliott N. Shaw, Shoreham, N.Y., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Original application May 22, 1972, Ser. No. 255,709, now Patent No. 3,778,276. Divided and this application July 9, 1973, Ser. No. 377,782

Int. Cl. C08h 7/00

U.S. Cl. 106—135 7 Claims

Aqueous solutions of gelatin and gelatin-containing layers such as photographic silver halide emulsions containing benzyloxycarbonyl phenylalanine chloromethyl ketone and benzyloxycarbonyl phenylalanine bromomethyl ketone to control enzyme activity and decelerate bacterial growth and reproduction. A phenolic biostat may optionally be added for improved results.

3,832,199

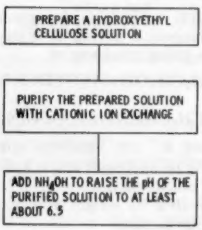
PHOSPHOR SUSPENSION CONTAINING HYDROXYETHYL CELLULOSE

Robert W. Repsher, Bloomfield, N.J., and William A. Tarleton and William E. Wilson, Fairmont, W. Va., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1973, Ser. No. 411,887

Int. Cl. C08b 21/24, 27/04

U.S. Cl. 106—183 3 Claims


PREPARE A HYDROXYETHYL CELLULOSE SOLUTION
PURIFY THE PREPARED SOLUTION WITH CATIONIC ION EXCHANGE
ADD NH4OH TO RAISE THE pH OF THE PURIFIED SOLUTION TO AT LEAST ABOUT 6.5

Method of preparing a suspension in a vehicle for use including discharge lamp envelopes, wherein an aqueous solution of hydroxyethyl cellulose is prepared, filtered and purified by using a cation ion exchange resin to remove the sodium ions of the sodium acetate impurity, but leave the acetate ions. Ammonium hydroxide is then

added to raise the pH to at least of 6.5 and to react with the acetate ions to form ammonium acetate to inhibit mold growth. Preferably ammonium hydroxide is added to essentially neutralize the purified solution and a basic solution such as triethanolamine is then added to raise the pH of the solution to about 8.5–9.0, whereby bacteria growth is inhibited.

3,832,200

METHOD FOR THE PREPARATION OF BITUMINOUS PAVING COMPOSITIONS AND COMPOSITIONS OBTAINED THEREBY

Michel Kennel, Le Havre, and Joseph Quiquerez, Sainte-Adresse, France, assignors to Societe Anonyme dite Compagnie Francise de Raffinage, Paris, France

Continuation-in-part of abandoned application Ser. No. 98,974, Dec. 17, 1970. This application June 14, 1972, Ser. No. 262,542

Claims priority, application France, Dec. 17, 1969, 6943680; June 15, 1971, 7121713

Int. Cl. C08h *13/00, 17/02*

U.S. Cl. 106—281 R **5 Claims**

Bituminous paving compositions comprising a dry mineral aggregate, a dry filler, a preheated bituminous binder and hard asphalts in the form of a non-preheated powder are prepared by mixing said components in any order at a temperature in the range of about 140° C. to about 210° C., preferably 180° to 205° C. The hard asphalts preferably contain at least 40% by weight of hard asphaltenes and no more than 30% by weight of carboids. The hard asphalts may be precipitated around particles of filler by adding normal hexane to a suspension of the filler in a benzene solution of asphalts.

3,832,201

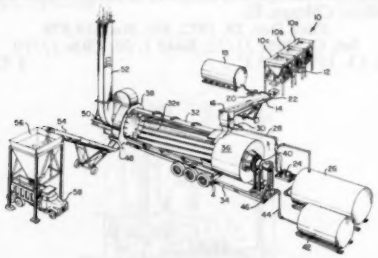
PROCESS FOR MAKING ASPHALT PAVING COMPOSITIONS

Herbert N. Shearer, Everett, Wash., assignor to Pavement Systems, Inc., Seattle, Wash.

Continuation-in-part of application Ser. No. 167,702, July 30, 1971, which is a continuation-in-part of Ser. No. 60,284, Aug. 3, 1970, both now abandoned. This application Nov. 3, 1972, Ser. No. 303,309

Int. Cl. B28c *5/06;* **C08h** *13/00, 17/02*

U.S. Cl. 106—281 **6 Claims**



Particulate emissions during production of asphalt concrete are controlled by contacting wet aggregate with an asphalt composition at or before introduction of the aggregate into a heated mixing and drying zone wherein the asphalt-aggregate mixture is moved through a relatively high velocity, heated gas stream in the mixer flowing parallel to the direction of movement of the asphalt mixture through the mixing and drying zone. The process, in addition to control of particulate emissions, results in less damage to the asphalt due to aging or hardening, and the ability to achieve a more uniform mixture compaction of the said asphalt concrete because the parallel flow enables more uniform temperature control of the asphalt and aggregate mixture on discharge from the mixing and drying zone. Means for automating production of the paving compositions are disclosed.

3,832,202

LIQUID SILICA SOURCE FOR SEMICONDUCTORS

Kim Ritchie, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

No Drawing. Filed Aug. 8, 1972, Ser. No. 278,833

Int. Cl. C09k *3/00*

U.S. Cl. 106—287 SE **6 Claims**

There is disclosed a liquid silica source for semiconductor diffusions which comprises in combination 54–64% ethyl alcohol, 11–21% ethyl acetate, 13–63% tetraethylorthosilicate, and 3–10% water and 1–8% vinyl trichlorosilane, said percentages being by weight. The liquid silica source may be readily coated onto the semiconductor wafer either by painting, spraying or preferably spinning.

3,832,203

WATER REPELLENT PROCESS AND COMPOSITION

Frederick Charles Saunders, Midland, Mich., and Charles Smith, Glamorgan, Wales, assignors to Dow Corning Limited, Berkshire, England

No Drawing. Filed Jan. 21, 1972, Ser. No. 219,902

Claims priority, application Great Britain, Feb. 3, 1971, 3,834/71

Int. Cl. C08g *47/02;* **C14c** *9/00*

U.S. Cl. 106—287 SB **5 Claims**

A composition for treating leather to impart durable water repellency thereto. The composition comprises a solvent solution of (1)(a) from 15 to 50 percent by weight of $Ti(OR)_4$ or $Zr(OR)_4$ or partial hydrolysate thereof in which R is an aliphatic hydrocarbon or hydroxylated hydrocarbon radical, (b) 5 to 70 percent by weight of a copolymer of trimethylsiloxane and SiO_2 units (c) 15 to 80 percent of a polysiloxane of average unit formula

$$R'_mSiO_{\frac{4-m}{2}}$$

in which R′ alkyl, alkenyl or aryl and m is 2 to 2.9 and (2) from 0.5 to 30 percent by weight of an aminoalkyl substituted silane or siloxane.

3,832,204

SILICATE POLYMER VEHICLES FOR USE IN PROTECTIVE COATINGS AND PROCESS OF MAKING

Donald P. Boaz, 5854 Preston View, Dallas, Tex. 75240

No Drawing. Continuation-in-part of application Ser. No. 70,215, Sept. 8, 1970, now Patent No. 3,730,746, which is a continuation-in-part of abandoned application Ser. No. 749,587, Aug. 2, 1968. This application Feb. 8, 1973, Ser. No. 330,696

The portion of the term of the patent subsequent to May 1, 1990, has been disclaimed

Int. Cl. C07g *17/00;* **C09d** *5/10*

U.S. Cl. 106—287 SE **19 Claims**

Silicate polymer vehicles are obtained by partially hydrolyzing alkyl silicate and reacting the resultant composition with a vinyl resin, such as polyvinyl butyral and one or more additives such as an alkyl orthoborate, an ambifunctional silane, or a Lewis Acid metal salt and ethyl cellulose to produce a vehicle for use in protective coatings of various kinds and particularly coatings for use on metal.

3,832,205

PIGMENTS OF SUBSTANTIALLY TERNARY SYSTEM HAVING OXIDES OF COLUMBIUM AND TRANSITIONAL ELEMENTS

Harold E. Lowery, Garfield Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

No Drawing. Filed Apr. 5, 1973, Ser. No. 348,099
Int. Cl. C08h *17/04*
U.S. Cl. 106—288 B 14 Claims

Pigments are disclosed comprising a substantially ternary system including a rutile-type supporting lattice and oxides of columbium and a transitional element selected from the group consisting of nickel, chromium, cobalt, manganese, vanadium, and mixtures thereof. The molar ratios of the oxides of columbium and the transitional element may vary much more widely than previously thought possible for added components while still obtaining stable pigments having acceptable color strength and durability. In a preferred form, the pigments comprise ternary oxide system having titania as the rutile-type supporting lattice and are free of heavy metals like lead, antimony, mercury, and the like. Optionally, the rutile-type supporting lattice may be replaced in part by an oxide of barium, magnesium, strontium, zinc, calcium or mixtures thereof.

3,832,206

PREPARATION OF A COMPOSITE PIGMENT CONTAINING TiO_2 AND $CaCO_3$

John J. Libera, Afton, and Charles R. Trampier, Jr., Webster Groves, Mo., assignors to NL Industries, Inc., New York, N.Y.

No Drawing. Filed Sept. 12, 1972, Ser. No. 288,391
Int. Cl. C09c *1/36*
U.S. Cl. 106—300 2 Claims

A new composition of matter comprising a coalesced composite pigment containing from 50% to 80% titanium dioxide, the remainder being calcium carbonate, said coalesced composite pigment having an alkaline pH above 8.0.

3,832,207

CALCIUM SULFITE COMPOSITIONS FOR PLASTIC COMPOSITE

Sueo Machi, Takasaki; Yasushi Matui, Satte-Machi; Hirondo Kurihara, Takasaki; Yoshiharu Hibi, Yokohama; Toshiaki Yagi, Takasaki; Takayuki Shinano, Yokohama, and Masaaki Takehisa, Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Maruzen Oil Company Limited, Osaka, and Mitsubishi Kakoki Kaisha Ltd., Tokyo, Japan

No Drawing. Filed Dec. 29, 1972, Ser. No. 319,753
Claims priority, application Japan, Dec. 29, 1971, 46/3,441; Jan. 14, 1972, 46/5,900
Int. Cl. C08h *17/00*; C08j *1/34, 1/36*
U.S. Cl. 106—308 M 12 Claims

A calcium sulfite composition having affinity with a thermoplastic resin is obtained by adhering a polysulfone resin to the surface of a calcium sulfite powder. The composition is suitable for preparing a calcium sulfite-plastic resin composite.

3,832,208

NACREOUS PIGMENTS TREATED WITH METHACRYLATOCHROMIC CHLORIDE FOR IMPROVED HUMIDITY RESISTANCE

Julius Jackson, Westfield, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Application Mar. 9, 1972, Ser. No. 233,287, which is a continuation-in-part of abandoned application Ser. No. 129,565, Mar. 30, 1971. Divided and this application May 22, 1973, Ser. No. 362,738
Int. Cl. C09c *1/36*
U.S. Cl. 106—308 Q 4 Claims

Titania-coated micaceous pigments are treated with methacrylatochromic chloride. Coating compositions containing such treated pigment provide improved resistance to weathering, particularly high humidity conditions.

3,832,209

DISPERSION COMPRISING PIGMENT, ORGANIC LIQUID AND POLYMERIC DEFLOCCULATING AGENT

Elizabeth Ann Baker, Glen Iris, Victoria, David Jankiel Wluka, Balaclava, Victoria, and Howard William Tankey, Box Hill North, Victoria, Australia, assignors to Imperial Chemical Industries of Australia and New Zealand Limited, Victoria, Australia

No Drawing. Continuation of abandoned application Ser. No. 143,246, May 13, 1971. This application June 20, 1973, Ser. No. 371,879
Claims priority, application Australia, May 26, 1970, 1,323/70
Int. Cl. C08h *17/00*; C09c *3/02*
U.S. Cl. 106—308 Q 11 Claims

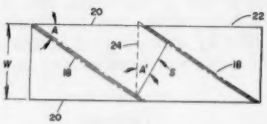
A dispersion comprising a pigment, an organic liquid and a polymeric deflocculating agent comprising a backbone chain having incorporated in, or dependent from it, firstly a group of internal salt structure and secondly a solubilizing group.

3,832,210

METHOD OF PREPARING A BIAS FABRIC

Raymond A. Rohlfing, Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Original application July 17, 1970, Ser. No. 57,378, now abandoned. Divided and this application June 19, 1972, Ser. No. 263,838
Int. Cl. B41k *3/68*
U.S. Cl. 117—4 1 Claim



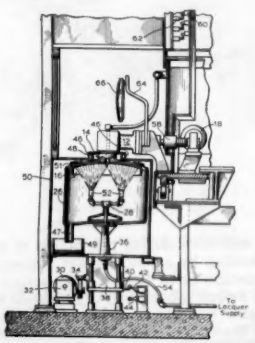
A method of preparing a bias fabric from a tubular fabric having selvages, which method reduces or minimizes wrinkling or puckering of the fabric when it is stretched, pantographed or calendered. The bias fabric is cut from the tubular fabric in a manner that controls occurrence of selvages across the width of the bias fabric.

3,832,211

METHOD OF LACQUERING CATHODE RAY TUBE PANELS

Charles A. Cook, Buffalo Grove, and Thaddeus J. Hajduk, Chicago, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 29, 1972, Ser. No. 319,970
Int. Cl. B05c *11/10*; B44d *1/08*; C03c *17/10*
U.S. Cl. 117—33.5 C 1 Claim



This disclosure depicts improved method and apparatus for automatically processing front panels of cathode ray

tubes in a continuous step-by-step fashion including spraying a lacquer coating onto a phosphor coating on the panels. The front panels are loaded in a front-side-up attitude onto an annular endless conveyor which is stepped around a plurality of discrete work stations disposed around the perimeter of the conveyor, each of the work stations being adapted to perform at least one predetermined operation on the panels. Lacquer applicator means is situated in at least one of said work stations for applying a lacquer coating on the panels. Enclosure means are provided for enclosing the lacquer applicator and associated drying stations to prevent escape of lacquer vapors to the environment. Vertically movable shroud means are provided at the lacquer application station for enshrouding the panels during the lacquer applying operation to minimize air currents which might disturb the surface of the wet lacquer coating.

3,832,212

HEAT-SENSITIVE COPYING SYSTEMS

Philip W. Jenkins, Donald W. Heseltine, and John D. Mee, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Application Jan. 13, 1971, Ser. No. 106,231, now Patent No. 3,770,451, which is a division of application Ser. No. 766,307, Oct. 9, 1968, now Patent No. 3,615,432. Divided and this application Nov. 8, 1972, Ser. No. 304,674

Int. Cl. B41m *5/00*

U.S. Cl. 117—36.7 **17 Claims**

Heat sensitive compounds containing heterocyclic nitrogen atoms substituted with an —OR group fragment under the influence of various forms of energy to form a dye base, a proton and an aldehyde, these materials being useful in image reproduction.

3,832,213

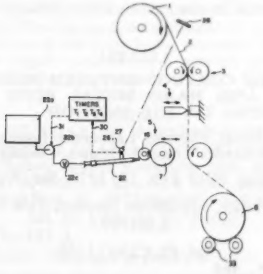
METHOD FOR APPLYING GLUE TO LEADING AND TRAILING EDGES OF A WRAPPER SHEET

Lawrence A. Bremer, West Chester, Pa., assignor to Beloit Corporation, Beloit, Wis.

Original application Mar. 13, 1970, Ser. No. 19,419, now Patent No. 3,688,735. Divided and this application May 9, 1972, Ser. No. 251,843

Int. Cl. B05c *1/00;* **B41k** *1/22*

U.S. Cl. 117—44 **5 Claims**



Glue is applied to a roller by means of a glue supply head which traverses the length of the roller. The flow of glue can be initiated and terminated at predetermined times during a single traverse thus providing a layer of glue on the roller neatly and occupying a predetermined length of the roller. The layer is then transferred to the wrapper sheet. Where the glue is to be transferred to a leading edge, the glue flow is initiated and terminated at times to give a glue layer which is less in width than the width of the wrapper sheet. When the glue is to be transferred to a trailing edge, the width of the glue layer is equal to the width of the wrapper sheet. The device preferably includes photodetector means moveable with the glue supply means to initiate and terminate the glue flows a set time after the side edges of the wrapper sheet are detected by the photodetector means.

3,832,214

ELASTOMERIC FILM AND PRODUCT THEREFROM

Wu Lan Wang, Newark, N.J., assignor to Tenneco Chemicals, Inc.

No Drawing. Original application June 6, 1968, Ser. No. 734,887, now Patent No. 3,634,184. Divided and this application June 28, 1971, Ser. No. 157,716

Int. Cl. B29d *27/04;* **B44d** *1/09*

U.S. Cl. 117—47 R **6 Claims**

Supple, microporous, breathable elastomeric films with a system of intercommunicating cells are described. The films which optionally contain inert organic or inorganic particles varying in size from about 0.02 micron to 150 microns are prepared by deposition from a solution spread on a suitable surface. Deposition is effected by exposure of the solution to a liquid which is miscible with the solvent but which does not dissolve the elastomer. The use of the film in the preparation of leather replacement compositions by integration as a grain layer in and on the surface of suitable substrates is described. For this use the selected substrate is wet with a liquid in which the elastomer is insoluble, coated with a solution of the elastomer in a solvent which is miscible with the liquid used to wet substrate, and the wet, coated substrate is treated with additional liquid to deposit the elastomer extending into the upper strata of the substrate and above its surface.

3,832,215

METHODS OF MANUFACTURING WATER-PROOF CABLE

Edward L. Franke, Jr., Perry Hall, and William J. Hyde, Baltimore, Md., assignors to Western Electric Company, Incorporated, New York, N.Y.

Continuation of application Ser. No. 155,055, June 21, 1971. This application June 13, 1973, Ser. No. 369,653

Int. Cl. B05c *3/12;* **H01b** *13/06*

U.S. Cl. 117—61 **3 Claims**

A cable core having stranded twisted pairs of insulated conductors is moved axially through a series of in-line chambers having interconnect dies to facilitate the evacuation of air from voids of the interstitial structure of the core and the pressure-application of a waterproofing compound of jelly-like consistency into the air-evacuated voids.

3,832,216

METHOD OF CAST-COATING PAPER

Philo Burton Cressey, Jr., Gorham, Maine, assignor to Scott Paper Company, Delaware County, Pa.

No Drawing. Filed Jan. 14, 1972, Ser. No. 218,012

Int. Cl. B44d *1/44*

U.S. Cl. 117—64 C **5 Claims**

A method of cast-coating paper using an aqueous paper coating composition wherein the adhesive consists essentially of latices, at least one being alkali-swellable or alkali-soluble and at least one not being alkali-swellable or alkali-soluble, the pH of the composition being such

that the alkali-swellable or alkali-soluble latex remains in the unswelled or undissolved condition.

3,832,217

PROCESS FOR FORMING EXTERIOR FINISH COATING FILMS FOR AUTOMOBILE BODIES

Kozo Sato, Eizo Nakatani, and Kiyoshi Ichimura, Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

No Drawing. Filed Dec. 15, 1971, Ser. No. 208,404

Claims priority, application Japan, Dec. 15, 1970, 45/111,234

Int. Cl. B32b *15/08*

U.S. Cl. 117—74 **20 Claims**

Coating composition for forming pigmented exterior finish coatings which comprise a thermosetting resin composition (I) comprising of about 40 to about 90 parts by weight of a thermosetting acrylic copolymer (A) having (a) a carboxylic acid hydroxyalkyl ester structual unit in which the hydroxyalkyl has 1–8 carbon atoms, (b) a carboxylic acid amide structual unit in which at least one hydrogen atom of the amide is substituted by a group represented by formula

$$-\mathrm{CHOR_1}$$

wherein R and R_1 each represents a hydrogen atom or lower alkyl group having 1–8 carbon atoms, (c) a carboxylic acid structual unit and (d) another monomer structual unit different from (a), (b) and (c), (B) about 4 to about 50 parts by weight of aminoplast resin and (C) about 30 parts by weight or less of cellulose acetate butyrate in which the total amount is 100 parts by weight, and a coloring pigment (II). Exterior coating films comprising an undercoating film of the above composition and a top clear coating film of a thermosetting acrylic resin composition (III) which comprises about 40 parts to 96 parts by weight of an acrylic copolymer (F) containing about 4 to about 30 parts by weight of a carboxylic acid hydroxylalkyl ester structual unit, about 15% by weight or less of a carboxylic acid amide structual unit in which at least a hydrogen in the amide is substituted by a group represented by the formula

$$-\mathrm{CHOR_1}$$

wherein R and R_1 are hydrogen or a lower alkyl group having 1–8 carbon atoms and about 0.1% to about 10% by weight of a carboxylic acid structual unit, 4–50 parts by weight of aminoplast resin (G) and 30 parts by weight or less of cellulose acetate butyrate (H). A process for forming an exterior finish coating comprising applying a pigmented enamel (I) comprising a thermosetting acrylic resin composition (D) and a coloring pigment (II) to a substrate treated with a primer, setting, applying a thermosetting acrylic resin composition (III), and thereafter baking the coated substrate at a temperature and for a time sufficient to crosslink said thermosetting resins.

3,832,218

LIGHT-INTERCEPTING PAPER FOR PHOTOGRAPHIC FILM

Yoshihiro Seto, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

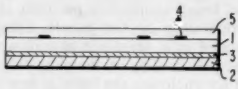
Filed July 25, 1972, Ser. No. 275,004

Claims priority, application Japan, July 27, 1971, 46/56,138

Int. Cl. D21h *1/28;* **G03c** *3/02*

U.S. Cl. 117—76 P **4 Claims**

A light-intercepting paper for a photographic film comprising a paper having on at least one side of said paper a light-intercepting layer comprising carbon black dispersed in a copolymer of ethylene and at least one ester selected from the group consisting of acrylic esters, methacrylic esters and mixtures thereof, wherein the alkyl



moiety of said esters has from 1 to 8 carbon atoms, and wherein said copolymer has a coplymerization molar ratio of said esters to ethylene of from 5:95 to 40:60 is disclosed.

3,832,219

METHODS OF TREATING STEEL SURFACES TO MODIFY THEIR STRUCTURE

Richard Stuart Nelson, Goring-on-Thames, David John Mazey, Abingdon, and John Adrian Hudson, Radley, England, assignors to United Kingdom Atomic Energy Authority, London, England

No Drawing. Filed Mar. 27, 1972, Ser. No. 238,619

Claims priority, application Great Britain, Apr. 7, 1971, 9,013/71

Int. Cl. C23c *11/00, 15/00*

U.S. Cl. 117—93.3 **3 Claims**

A method of treating a steel surface to modify the surface to improve its hardness or resistance to corrosion characterised in that the surace is subjected to the implantation of selected ions adapted so to modify the surface structure as to improve its hardness or corrosion resistance.

3,832,220

METHOD OF COATING PLASTIC FOAM SCRAP

William H. Plumb, Snyder, N.Y., assignor to National Gypsum Company, Buffalo, N.Y.

No Drawing. Filed Apr. 27, 1972, Ser. No. 248,245

Int. Cl. B44d *1/02*

U.S. Cl. 117—100 C **3 Claims**

A method is disclosed for improving the fire resistance of chopped plastic foam, such as polyurethane foam, which include tumbling together an aqueous slurry of calcined gypsum and the chopped plastic foam particles.

3,832,221

METHOD OF COATING SINTERED HARD METAL BODIES AND HARD METAL BODY COATED ACCORDING TO THE METHOD

Carl Sven Gustaf Ekemar, Lannersta, Sweden, assignor to Sandco Limited, Ottawa, Canada

No Drawing. Filed Feb. 13, 1970, Ser. No. 11,294

Claims priority, application Sweden, Feb. 21, 1969, 2,401/69

Int. Cl. C23c *11/00*

U.S. Cl. 117—106 **1 Claim**

The invention resides in an improved method of applying to a surface of a sintered hard metal body a thin layer of an extremely hard and wear-resistant metallic carbide. The method consists in heating the body to an elevated temperature in an atmosphere of a gas mixture composed of hydrogen, a gaseous compound of the metal from which said metallic carbides is to be formed and an amount of a gaseous hydrocarbon so restricted as to be

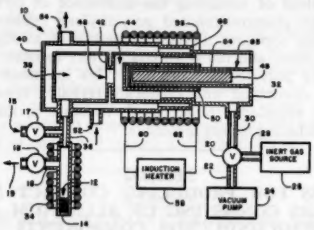
unable to supply a major proportion of the carbon necessary for the development of said metallic carbide.

3,832,222

CHEMICAL VAPOR DEPOSITION OF URANIUM AND PLUTONIUM

Larry R. Crisler, Arvada, and William G. Eggerman, Boulder, Colo., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 27, 1972, Ser. No. 318,807
Int. Cl. C23c 11/02
U.S. Cl. 117—107.2 R 6 Claims



Uranium (U) or plutonium (Pu) is deposited upon a substrate by vaporizing triscyclopentadienyluranium (IV) chloride (Cp_3UCl) or plutonium (III) tricyclopentadienide ($PuCp_3$), heating the substrate upon which the Pu or U is to be deposited to from about 600° C. to about 900° C., and contacting the vaporized compound with the heated substrate to deposit a coating of U or Pu respectively.

3,832,223

METHOD OF TREATING FRESH HYDRAULIC CEMENTITIOUS COMPOSITIONS

Sanford M. Wohl, Cleveland, Ohio, assignor to The Tremco Manufacturing Company, Cleveland, Ohio

No Drawing. Filed May 22, 1972, Ser. No. 255,829
Int. Cl. C04b 25/02
U.S. Cl. 117—123 E 5 Claims

Method of curing and waterproofing a body of fresh hydraulic cementitious composition, e.g. concrete, by separately directing toward an exposed surface of the fresh body, an aqueous emulsion of a film forming material, e.g. rubberized asphalt, and a chemical coagulant for the emulsion thereby forming a coagulum in situ on the exposed surface of the body in the nature of a membrane having low vapor transmitting properties and/or resistance to liquid water penetration.

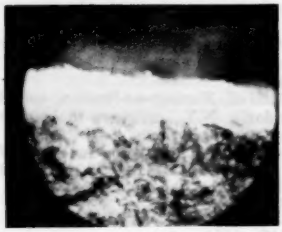
3,832,224

METHOD OF COATING PRESSED VERMICULITE WITH A GLAZE COMPOSITION

Patrick Michael Brown, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Nov. 17, 1972, Ser. No. 307,752
Int. Cl. C03c 17/02, 25/00
U.S. Cl. 117—123 A 1 Claim

The invention disclosed provides a novel glaze composition comprising as essential components from about 18 to about 30 parts by weight of boron oxide, from about 35 to about 55 parts by weight of silicon dioxide, from about 5 to about 20 parts by weight of aluminum oxide, from about 7 to about 15 parts by weight of calcium oxide from about 1.0 to about 3.0 parts by weight of sodium oxide, from about 0.5 to about 2.0 parts by weight of potassium oxide, from about 1.0 to about 8 parts by weight of zinc oxide. When fired as a coating on a pressed vermiculite body, the glaze components fuse to form a glaze coated article which, after cooling, typically has increased strength, excellent hardness, and improved resistance to moisture permeation. The glazed article is especially useful in the form of a panel for interior or exterior construction.

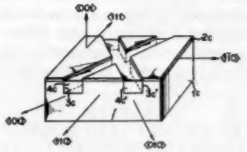


3,832,225

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Toshiro Matsui, Tokyo, Masashi Nakagawa, and Tadashi, Utagawa, Yokohama, and Makoto Tokunaga, Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Aug. 19, 1970, Ser. No. 65,262
Claims priority, application Japan, Aug. 21, 1969, 44/65,681
Int. Cl. B44d 1/18
U.S. Cl. 117—212 2 Claims



A method of manufacturing a semiconductor device in good reproducibility and yield which comprises providing a single crystal semiconductor substrate of zinc blende type having a (001) plane in which a <001> orientation is defined as a fourfold rotation inversion axis, coating the (001) plane with a protective film, removing by means of a reaction-limited etching solution that part of the protective film which is disposed between two straight lines parallel with the direction in which the aforementioned (001) plane can be etched at a uniform speed so as to form an etched groove, and forming an epitaxially grown layer of another single crystal semiconductor in the etched groove.

3,832,226

METHOD FOR DRY ELECTROSTATIC COATING

Taizo Kondo and Keizo Inamura, Hiratsuka, Japan, assignors to Kansai Paint Company Limited, Amagasaki-shi, Hyogo-ken, Japan

No Drawing. Original application May 13, 1969, Ser. No. 824,280, now abandoned. Divided and this application Apr. 27, 1971, Ser. No. 137,995
Claims priority, application Japan, May 21, 1968, 43/34,472
Int. Cl. B05b 4/02; B44d 1/92, 1/94
U.S. Cl. 117—17 7 Claims

A method for dry electrostatic coating of base metal surfaces to provide continuous, even, resin films free of pin-holes and cissings without the necessity of pre-heating the base metal by coating the surface of the base metal

with a primer comprising a vehicle and an electroconductive particulate material having a particle size of not more than 100μ, such as aluminum powder, in an amount necessary to produce a dry film having a volume resistivity of 10^9 to 10^{14} ohm-cm., and drying the film.

3,832,227

USE OF TRIAZINYLAMINOALKYL PHOSPHONATES FOR THE FLAMEPROOFING OF TEXTILES

Edward D. Weil, Hastings-on-Hudson, and Ralph Fearing, Bardonia, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

No Drawing. Original application June 26, 1970, Ser. No. 50,364, now Patent No. 3,755,323, dated Aug. 28, 1973. Divided and this application Oct. 2, 1972, Ser. No. 293,973

Int. Cl. C09d 5/18

U.S. Cl. 117—136 3 Claims

A process for the flameproofing of textiles by treating the textile with a novel class of triazinylaminoalkyl phosphonates and the crosslinking of the phosphonates to yield a fire retardant finish for the textile is disclosed. These triazinylaminoalkyl phosphonates are found to be low in cost and of minimal toxicity and their use for the flameproofing of textiles provides highly durable finishes.

3,832,228

PROCESS FOR RENDERING KERATINOUS FIBERS RESISTANT TO SHRINKAGE

William Gardiner, Glamorgan, Wales, and Frederick Charles Saunders, Midland, Mich., assignors to Dow Corning Limited, Whitehall, London, England

No Drawing. Filed Aug. 25, 1972, Ser. No. 286,518

Int. Cl. D06m 3/02, 3/08

U.S. Cl. 117—141 7 Claims

Process for treating keratinous fibers with one or more organoposysiloxanes having in the molecule organic substituents containing both imino and amino radicals. The process finds application in rendering wool and other keratinous fibers resistant to shrinkage on laundering.

3,832,229

METHOD OF USING LATEX POLYMER FORMULATIONS FOR SEEPAGE CONTROL

Paul L. Du Brow, Chicago, and Alvin J. Frisque, La Grange, Ill., assignors to Nalco Chemical Company, Chicago, Ill.

No Drawing. Filed Oct. 6, 1972, Ser. No. 295,633

Int. Cl. E02b 3/00

U.S. Cl. 117—161 UA 10 Claims

A method of seepage control which comprises contacting a surface with either: (1) water-in-oil emulsion containing dispersed throughout a finely-divided water-soluble vinyl addition polymer; or (2) a stable liquid dispersion of a water-soluble anionic vinyl addition polymer and a water-soluble cationic polymer.

3,832,230

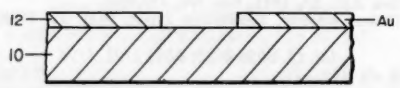
METHOD FOR IMPROVING GLASS ADHERENCE TO GOLD FILM

Lewis E. Terry, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Original application July 24, 1970, Ser. No. 58,102. Divided and this application Mar. 6, 1972, Ser. No. 231,812

Int. Cl. B44d 1/14, 1/18; C03c 15/00

U.S. Cl. 117—217 4 Claims



A method for improving the adherence of glass to a gold film is disclosed. A layer of a metal such as tantalum is deposited on the gold film. The metal layer is heated in an oxidizing atmosphere to convert the metal to a metal oxide. A layer of glass is then deposited on top of the metal oxide layer.

3,832,231

METHOD OF RENDERING CHLOROSULFONATED POLYETHYLENE RUBBER RESISTANT TO ADHERENCE OF DIRT, AND THE DIRT RESISTING PRODUCTS THEREOF

Paul Otis Nicodemus, Chelmsford, Mass., assignor to General Electric Company

No Drawing. Filed Aug. 21, 1972, Ser. No. 282,403

Int. Cl. H01b 3/28

U.S. Cl. 117—218 14 Claims

A method of inhibiting the adherence of dirt to the surface of chlorosulfonated polyethylene rubber bodies comprising applying thereto a coating of methyl-methacrylate resin, and the resin coated, dirt resistant chlorosulfonated polyethylene product. This invention is particularly concerned with rendering Hypalon type rubber electrical applicance power cords resistant to the adherence of defacing soiling materials.

3,832,232

PROCESS FOR PRODUCING CONTACT METAL LAYERS CONSISTING OF ALUMINUM ALLOY ON SEMICONDUCTOR COMPONENTS

Heinrich Sohlbrand, Munich, Germany, assignor to Siemens Aktiengesellschaft, Erlangen and Berlin, Germany

Continuation of abandoned application Ser. No. 123,186, Mar. 11, 1971. This application Feb. 26, 1973, Ser. No. 335,726

Claims priority, application Germany, Mar. 13, 1970, P 20 12 063.2

Int. Cl. H01l 1/14

U.S. Cl. 117—227 9 Claims

A method of producing contact metal layers consisting of aluminum alloys on semiconductor components. The surface of the semiconductor body is provided with an organic varnish solution containing the metal compound. The latter is transferred by thermolysis into a pure metal layer. The appropriate metal alanate compounds are used for producing the aluminum containing alloy contacts. The method is particularly suited for producing titanium or silver containing aluminum contacts on semiconductor crystal surfaces.

3,832,233

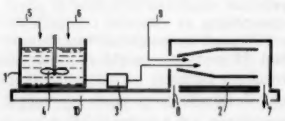
METHOD FOR REMOVING THE FAT FROM FAT-CONTAINING RAW MATERIALS

Hartwig E. Fritze, Ravensburg, Germany, assignor to Escher Wyss GmbH, Ravensburg, Germany

Filed Mar. 3, 1972, Ser. No. 231,535

Int. Cl. C11b 1/10; C13l 1/02

U.S. Cl. 127—68 8 Claims



Process for de-fatting fat-containing, dryly degerminated seed material, such as corn grits, which involves

soaking a ground fraction of the seed material with a fat solvent and separating the solvent from the de-fatted seed material. The process is especially applicable to obtaining starch from corn grits.

3,832,234
METHOD OF CLEANING VEHICLES WITH A THICKENED ACID COMPOSITION

Joseph V. Otrhalek, Dearborn, and Robert E. Gansser, Wyandotte, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

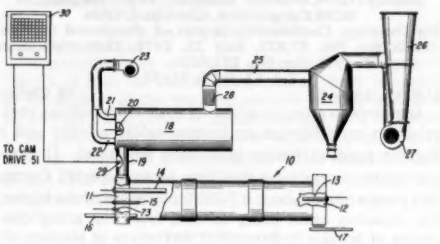
No Drawing. Continuation-in-part of application Ser. No. 288,772, Sept. 13, 1972, now Patent No. 3,793,221. This application Sept. 20, 1973, Ser. No. 399,091
Int. Cl. B08b *7/00*
U.S. Cl. 134—4 **2 Claims**

A method for removing siliceous and/or oily soils from vehicles such as railroad rolling stock by applying a thickened acid composition consisting essentially of an aqueous hydrochloric acid, an organic acid, a nonionic surfactant, an anionic surfactant, and water; allowing the composition to remain in contact with the vehicle for a period of time; and rinsing twice with water.

3,832,235
VAPOR SOLVENT PAINT REMOVING METHOD

Joseph Cooper, and William J. Corbett, Cincinnati, Ohio, assignors to Chemed Corporation, Cincinnati, Ohio

No Drawing. Application May 28, 1971, Ser. No. 148,213, now Patent No. 3,743,542, which is a division of application Ser. No. 817,160, Apr. 17, 1969, now Patent No. 3,629,004. Divided and this application Jan. 31, 1973, Ser. No. 328,574
The portion of the term of the patent subsequent to Dec. 21, 1988, has been disclaimed
Int. Cl. B08b *5/00, 7/00;* **C23g** *5/02*
U.S. Cl. 134—31 **7 Claims**



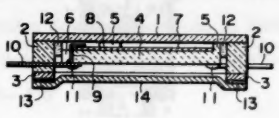
A method is disclosed for removing paint from metal surfaces by boiling a solvent or solvent mixture and contacting the painted metal surface with the vapors of the solvent mixture.

3,832,236
PHOTOCONDUCTIVE CELL STRUCTURE

Hiroshi Tomita, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

Filed Aug. 24, 1972, Ser. No. 283,282
Claims priority, application Japan, Aug. 28, 1971, 46/77,183
Int. Cl. H01l *15/02*
U.S. Cl. 136—89 **9 Claims**

A photoconductive cell wherein a plurality of small projections are formed on one surface of an insulating thin plate provided with a number of notched portions on its periphery. The number of small projections are low and uniform in height and are made of a material similar to that of the insulating thin plate. A thin layer of a photoconductive material is formed on one surface of the thin insulating plate, exclusive of the portions at which the small projections are formed. Conductive layers are disposed in spaced relationship from each other on the photoconductive surface to constitute electrodes and extend through the notched portions, the small projections which extend upwardly from the photoconductive layer

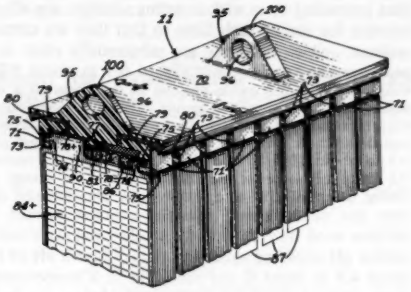


are spacer elements between the photoconductive surface and a transparent plate, when the insulating plate is inserted within the casing so that the photoconductive surface confronts the transparent plate of the casing. Lead wires are enclosed through the insulating side walls of the casing and electrically and mechanically connected with electrodes within the notched portions.

3,832,237
EXCHANGEABLE ELEMENTS FOR A STORAGE BATTERY

Lewis R. Kinsey, 108 S. 25th St., Phoenix, Ariz., 85034

Original application Feb. 18, 1971, Ser. No. 116,400. Divided and this application Oct. 24, 1972, Ser. No. 299,913
Int. Cl. H01m *13/10*
U.S. Cl. 136—134 **4 Claims**



A rebuildable, rechargeable wet cell storage type battery employing a novel replaceable modular plate structure.

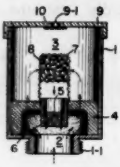
3,832,238
GAS RECOVERY DEVICE FOR STORAGE BATTERIES

Takao Marui, and Atsusi Yokogi, Takatsuki, Japan, assignors to Yuasa Battery Company Limited, Takatsuki, Japan

Continuation of abandoned application Ser. No. 161,243, July 9, 1971. This application Aug. 27, 1973, Ser. No. 392,079
Int. Cl. H01m *1/06*
U.S. Cl. 136—179 **14 Claims**

Gas recovering devices for storage batteries comprise a catalyst body disposed in a housing defining a gas recovering chamber which is isolated from the gas space within the storage battery by a sintered, porous, explosion preventing structure disposed between the body of catalyst and an opening from the housing disposed for intercommunicating the latter and the interior of the battery. The sintered, porous, explosition preventing structure includes a water-repellent portion and a water-perme-

able portion. The water-permeable portion is disposed beneath the catalyst body for returning water produced in the catalyst to the interior of the battery through the



opening. The water-repellent portion is disposed to facilitate the passage of gases developed in the battery during the charging of the latter into contact with the catalyst body.

3,832,239
PRODUCTION OF CLEAR, SEALED ANODIZED FILMS

Geraldine M. Hoch, Chatsworth, and Kenneth E. Weber, Granada Hills, Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

No Drawing. Continuation-in-part of application Ser. No. 881,884, Dec. 3, 1969. This application Dec. 26, 1972, Ser. No. 318,522

Int. Cl. C23c *5/50*

U.S. Cl. 204—35 N **2 Claims**

It is conventional to seal anodized films produced on aluminum surfaces by electroylsis in a sulfuric acid electrolyte by neutralizing such films, washing them and then contacting them with a sealing solution. An effective solution for sealing such films so that they are corrosion resistant and so that they are substantially clear in appearance can consist essentially of 0.1 to about 5% by weight of chromic oxide present in the form of a compound selected from the group consisting essentially of chromic acid and ammonium and alkali metal chromate and dichromate salts and mixtures thereof and from about 0.5 to about 10% by weight of tungstate ions present in the form of a compound selected from the group consisting essentially of ammonium and alkali metal tungstate and metatungstate salts and mixtures thereof. The solution used may contain an alkali metal hydroxide or similar pH adjusting agent and should have a pH of from about 4.5 to about 8 and should be at a temperature of from about 130° F. to immediately below the boiling point of the solution.

3,832,240
PRODUCTION OF EXTENDIBLE RODS

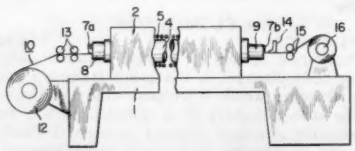
Moritada Kubo, Tokyo-to, and Yasuo Nogiwa, Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa-ken, Japan

Filed Aug. 2, 1971, Ser. No. 168,217

Claims priority, application Japan, Aug. 1, 1970, 45/67,586, 45/67,587

Int. Cl. C22f *1/08*

U.S. Cl. 148—11.5 R **7 Claims**



A ribbon foil spring material protected by a layer of a reinforcing material is passed through an inlet die and through an annular heat treatment passageway formed between a cylinder and a mandrel disposed therewithin, the cylinder being disposed within a furnace, thereby to deform plastically the foil spring material into a tubular shape and to harden the same permanently as wrinkling thereof is prevented by the reinforcing material, which is finally burned and dispersed in the heat-treatment passageway.

3,832,241
COPPER-BASE ALLOY CONTAINING TITANIUM AND ANTIMONY

Donald J. Nesslage, Old Bridge, and Lin S. Yu, Franklin Park, N.J., assignors to Phelps Dodge Industries, Inc., New York, N.Y.

Original application Sept. 25, 1972, Ser. No. 292,186, now Patent No. 3,773,505. Divided and this application Aug. 8, 1973, Ser. No. 386,508

Int. Cl. C22c *9/00;* **C22f** *1/08*

U.S. Cl. 148—12.7 **4 Claims**

Disclosed are alloy compositions consisting essentially of copper and small amounts of titanium and antimony within stated ranges. These compositions have high electrical conductivity, high strength and high ductility as compared with copper alloys containing either titanium or antimony. The disclosed ranges of alloy compositions provide a class of copper-base alloys having a unique flexibility with regard to electrical, mechanical and physical properties. By varying the relative and total amounts of titanium and antimony, copper-base alloys having predictable and differing properties may be obtained. Methods for the heat treatment and fabrication of the alloys are also disclosed.

3,832,242
BRAZING AND SOLDER COMPOSITIONS COMPRISING A CHELATING AGENT

Stanley G. Cuthbert, Munster, Ind., assignor to SCM Corporation, Cleveland, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 57,822, July 23, 1970. This application Aug. 17, 1972, Ser. No. 281,543

Int. Cl. B23k *35/34*

U.S. Cl. 148—24 **10 Claims**

Improved brazing or soldering paste compositions comprising a metalliferous or brazing solder powder and a fugitive resinous binder have been developed. The improvement comprises a chelating agent dispersed therein in a proportion of about 0.3–10% by weight of the binder, the chelating agent being selected from the group consisting of tetrakis hydroxyalkyl derivatives of alkylene diamines, tetrakis carboxy alkyl derivatives of diamine, alkali metal salts of tetrakis carboxy alkyl derivatives of alkyl diamines and hydroxy carboxylic acids.

3,832,243
SHAPE MEMORY ELEMENTS

Hendrik Cornelis Donkersloot and Johannes Hendrikus Nicolaas van Vucht, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Jan. 14, 1971, Ser. No. 106,554

Claims priority, application Netherlands, Feb. 25, 1970, 7002632

Int. Cl. C22c *9/00*

U.S. Cl. 148—32 **5 Claims**

Intermetallic compounds which, upon cooling below a characteristic temperature T_t, are subjected to a so-called martensite crystal transformation to a crystal structure having a closer packing may be used as shape memory elements. Shape memory elements have the property that, after deformation at a temperature below T_t, they reassume their original shape by heating above T_t.

3,832,244
STAINLESS STEEL

Kenneth E. Pinnow, J. M. Mehta, and A. Moskowitz, Pittsburgh, Pa., assignors to Crucible Inc., Pittsburgh, Pa.

No Drawing. Original application May 28, 1968, Ser. No. 732,542, now Patent No. 3,778,316. Divided and this application Jan. 11, 1971, Ser. No. 105,690
Int. Cl. C22c *39/14*
U.S. Cl. 148—37 5 Claims

This invention relates to a stainless steel and a method for producing the same, whereby material particularly adapted for use in structural applications such as the manufacture of cargo boxes is achieved. Specifically, the material is characterized by an improved combination of strength and toughness that is achieved by producing hot-band material having a substantially martensitic microstructure of a composition consisting of .10 max. percent carbon, 2 max. percent manganese, 1 max. percent nickel, 9.5 to 13.5 percent chromium, and the balance iron. This material has a maximum titanium to carbon ratio of about 8. With titanium to carbon ratios of between 4 to 8, nickel must be present within the range of .5 to 1 percent. For optimum weld-toughness the maximum titanium to carbon ratio is about 4, either with or without nickel. To achieve the desired combination of strength and toughness, the material in hot-band gage is annealed for a time at temperature to achieve a hardness of at least 80 R_b and preferably 82 to 92 R_b.

3,832,245
METHOD OF MANUFACTURING AN OBJECT OF SILICON STEEL HAVING LOW SULPHUR CONTENT

Carl-Artur Akerblom, Surahammar, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

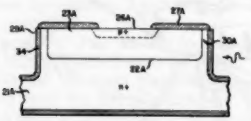
Filed May 30, 1972, Ser. No. 257,781
Claims priority, application Sweden, June 14, 1971, 7,658/71; May 5, 1972, 5,910/72
Int. Cl. H01f *1/04*
U.S. Cl. 148—113 3 Claims

In manufacturing objects of silicon steel such as strip, sheet and rods for electrical equipment, there is applied to the surface of the material particles of a hydroxide of an alkaline earth metal or aluminium and/or a carbonate of an alkaline earth metal and/or oxide of alkaline earth metal or aluminium in combination with a vanadium compound. The object is then subjected to a heating at a temperature of at least 850° C., and preferably 1000–1300° C.

3,832,246
METHODS FOR MAKING AVALANCHE DIODES

William Thomas Lynch, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 22, 1972, Ser. No. 255,575
Int. Cl. H01l *5/00, 7/36, 7/44*
U.S. Cl. 148—175 10 Claims

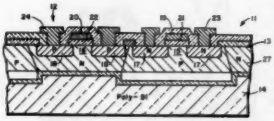


Edge breakdown in an epitaxial avalanche photodiode is eliminated by using the mesa etch technique to define the active device, and then doping the mesa sidewalls to a relatively high resistivity with impurities of the substrate conductivity type. In one embodiment, deposited silicon dioxide surrounds the mesa to give a planar external configuration; and in another embodiment, anisotropic etching of the mesa produces a vertical sidewall against which incident light may be directed.

3,832,247
PROCESS FOR MANUFACTURING INTEGRATED CIRCUITS

Ivan R. Saddler, Scottsdale, and John A. Fisher, Mesa, Ariz., assignors to Motorola Inc., Chicago, Ill.

Filed June 22, 1973, Ser. No. 372,892
Int. Cl. H01l *7/36, 27/02*
U.S. Cl. 148—175 3 Claims

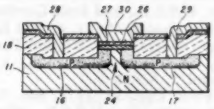


A process of manufacturing integrated circuits, particularly complementary integrated circuits, in an N-type semiconductor material which is formed upon an insulating substrate. The process includes steps of patterning a doping oxide such as aluminum oxide upon the semiconductor material; forming a dielectric layer over the semiconductor material and the doping layer; and then forming a polycrystalline silicon handle thereon. Following removal of most of the original semiconductor material, a heating step causes an up-diffusion from the doping layer into and through the semiconductor body to form P-type regions or tubs, therein.

3,832,248
METHOD OF FABRICATION OF INSULATED GATE FIELD EFFECT TRANSISTORS

Bernard Bazin, Paris, and Jean Albert, Cagnes-sur-Mer, France, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 3, 1971, Ser. No. 112,190
Int. Cl. H01l *7/44*
U.S. Cl. 148—187 3 Claims



An insulated gate field effect transistor having a self-aligned gate, reduced capacitance, and lower surface step heights is fabricated with the use of a silicon nitride layer which serves first as a diffusion mask, then as an oxidation barrier, and ultimately as a gate dielectric. In an alternate embodiment, lower threshold voltages are achieved by replacing the initial gate dielectric with a thinner dielectric having a reduced surface state density.

3,832,249
SAFE EXPLOSIVE CONTAINING DICYANO-FUROXANE AND METHOD

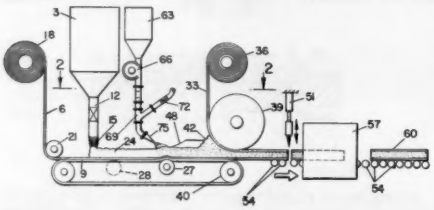
Richard H. Homewood, Andover, Val J. Krukonis, Lexington, and Raymond C. Loszewski, Methuen, Mass., assignors to AVCO Corporation, Cincinnati, Ohio

No Drawing. Filed Mar. 21, 1973, Ser. No. 343,333
Int. Cl. C06b *17/00*
U.S. Cl. 102—23 5 Claims

The present invention relates to a unique explosive composition, more precisely to an organic composition of carbon, nitrogen, and oxygen, viz., dicyanofuroxane, a com-

pound which has been found to be a safe castable material for forming shaped explosives.

3,832,250
METHOD OF FORMING GYPSUM BOARDS WITH HARDENING EDGES
Howard Brent Pearson, Las Vegas, Nev., assignor to Johns-Manville Corporation, New York, N.Y.
Filed July 24, 1972, Ser. No. 274,535
Int. Cl. B32b *30/04, 31/00*
U.S. Cl. 156—39 **5 Claims**



A process is described for the incorporation of corn syrup into the edges of gypsum boards to harden those edges. An aqueous corn syrup solution of defined concentration is injected into the edge of a stream of semifluid gypsum "mud" or paste simultaneously with vibration of that mud. The mud is thereafter molded and compressed to form a gypsum board and the impregnated portion of the mud forms the edges of the board. The board is then heated to dry the gypsum and the resulting dried board is found to have edges which are significantly harder than the edges of untreated gypsum boards.

3,832,251
METHOD FOR MANUFACTURING THE EDGE AND LOWER PLATE OF A SKI FROM WOOD
Agu Yanovich Aarna, bulvar Karla Marxa, 15, kv. 6; Karl Ritsovich Kiisler, Yakhimekhe Tee, 26, kv. 1; Peep Gerkhardovich Kristyanson, Sjutiste Tee, 34, kv. 38; Juri Albert-Mikhaelovich Tanner, Sjutiste Tee, 34, kv. 22; Juri Felixovich Vabaoya, ulitsa Suurtjuki, 5, kv. 1; all of Tallin, U.S.S.R., and Iosif Gershonovich Vaitsenberg, Rizhskoe shosse, 49, kv. 6; Juri Khindrekovich Rokk, Tallinskoe shosse, 4, kv. 27, and Toomas Oskarovich Matvere, Rizhskoe shosse, 98, kv. 2, all of Pyarnu Estonskoi, U.S.S.R.
No Drawing. Filed Dec. 30, 1971, Ser. No. 214,470
Claims priority, application U.S.S.R., Mar. 25, 1971, 1631037
Int. Cl. B32b *21/14;* **B44d** *1/26*
U.S. Cl. 156—60 **6 Claims**

A method including impregnation of wood with a mixture of a resorcinol monomer and dimethylol-carbamide, taken in a molecular ratio of 1:0.4–1.5 and dissolved in a mixture of water and organic solvents; drying at a temperature not exceeding 60° C. and glueing at a temperature of 80–120° C. and under a pressure of 5–50 kg./cm.^{2}.

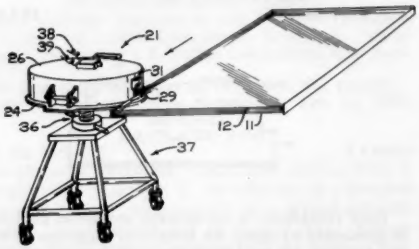
3,832,252
METHOD OF MAKING A DRUG-DELIVERY DEVICE
Takeru Higuchi, 2811 Schwarz Road, Lawrence, Kans. 66044; and Harold M. Leeper, 1040 Gest Drive, Mountain View, Calif.
Original application Sept. 29, 1970, Ser. No. 76,499, now Patent No. 3,710,795. Divided and this application Oct. 2, 1972, Ser. No. 293,919
Int. Cl. A61j *3/00*
U.S. Cl. 156—86 **4 Claims**

Drug-delivery device for releasing drug at a controlled rate for a prolonged period of time is formed from a solid inner matrix material having drug dispersed therethrough. Surrounding the inner matrix is an intimately contacting outer polymeric membrane, insoluble in body fluids, which contracts about the matrix as the matrix decreases in volume upon drug release. Both the inner matrix material and the outer polymeric membrane are permeable to passage of the drug by diffusion but the drug diffuses through the outer polymer membrane at a lesser rate so that passage through the polymeric membrane is the drug release rate controlling step. The integrity of the intimate contact between the membrane and the matrix is assured even upon matrix depletion immediately following manufacture and for an extended period of time by reason of the reserve elastic recovery stress in the membrane.

3,832,253
METHOD OF MAKING AN INFLATABLE BALLOON CATHETER
Giorgio Di Palma, Hanover Park, and Henry M. Gajewski, Winnetka, Ill., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.
Filed Mar. 21, 1973, Ser. No. 343,606
Int. Cl. B29c *27/00*
U.S. Cl. 156—86 **9 Claims**

A method is disclosed for making an inflatable balloon catheter. The method employs a number of heat shrinkable sleeves and adhesive to attach a catheter tip to a catheter shaft.

3,832,254
METHOD OF MAKING A MULTIPLE GLAZED UNIT HAVING A THERMOPLASTIC, SPACER-DEHYDRATOR ELEMENT
George H. Bowser, New Kensington, and Renato J. Mazzoni, Tarentum, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 14, 1972, Ser. No. 315,042
Int. Cl. B32b *1/04, 17/00;* **E04b** *2/28;* **E06b** *3/64;* **C03c** *27/00*
U.S. Cl. 156—107 **22 Claims**



In one embodiment of the invention, multiple glazed units are fabricated by heating a thermoplastic, spacer-

dehydrator element. The element is heated to a temperature sufficient to make the element plastic and render the element surfaces viscid. A pair of glass sheets are positioned about the heated element and urged toward each other against the element to form a hermetic seal. In another embodiment, a composite strip composed of a strip of precured, mastic sealant material having a bendable carrier tape adhered to one surface and a thermoplastic, spacer-dehydrator element adhered to the opposite surface is heated. The composite strip is heated to a temperature sufficient to make the element plastic. A segment of the composite strip is applied to a pair of glass sheets held in spaced relationship to each other. The segment is applied in such a manner that the element is inserted between opposed, marginal edges of the glass sheets with the sealant material facing the peripheral edges of the glass sheets. Thereafter, the carrier tape is pressed so as to flow portions of the sealant material into hermetically sealing contact with the edges of the glass sheets to produce a finished unit. In still another embodiment, the composite strip, instead of including a precured, mastic sealant material, includes a curable, mastic sealant material. The composite strip is heated to a temperature sufficient to make the element plastic. Before the sealant material cures, the composite strip is applied, as before, to the pair of glass sheets. Thereafter, the pressing step is performed to produce a finished unit.

3,832,255

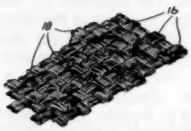
METHOD OF FABRICATING AN IMPROVED PLASTIC BEARING

Samuel Merle Shobert, Walkerton, Ind. (17760 Dragoon Trail, Mishawaka, Ind. 46544)

Application Jan. 9, 1970, Ser. No. 1,833, which is a continuation-in-part of abandoned application Ser. No. 800,955, Feb. 20, 1969. Divided and this application Sept. 8, 1972, Ser. No. 287,566

Int. Cl. D03d *1/00*

U.S. Cl. 156—148 **11 Claims**



A reinforced plastic bearing comprising a generally cylindrical structure of plastic reinforced with glass fiber, provided with a tubular layer of polytetrafluoroethylene fibers embedded and secured in the plastic. In the fabrication of this bearing, the polytetrafluoroethylene fibers are intertwined and formed into a cord having an irregular outer surface. The intertwining binds the fibers into position to inhibit relative motion thereof such that the cord is characterized by multiple length portions of the fibers in the outer cord surface, having opposite end portions anchored in position. This cord is formed into a woven fabric which becomes said tubular layer and which is impregnated with the aforesaid plastic in liquid form, the plastic flowing into the irregularities and interstices in the fabric and cord so as intimately to enrobe substantial portions of the cords and fibers, thereby securing them in position relative to each other.

Retention of the polytetrafluoroethylene fibers against delamination is, in one preferred method, maximized by use of a mandrel having a highly polished layer of polytetrafluoroethylene thereon. In removing the hardened bearing composite from the mandrel, the integrity of the plastic matrix which secures the polytetrafluoroethylene fibers in place is maintained.

3,832,256

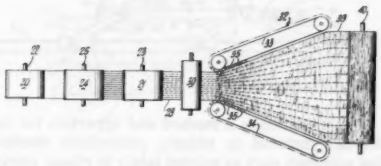
FABRIC AND METHOD FOR MANUFACTURING THE SAME

Frank Kalwaites, Gladstone, N.J., assignor to Johnson & Johnson

Filed Nov. 3, 1971, Ser. No. 195,184

Int. Cl. B32b *5/02, 31/16*

U.S. Cl. 156—179 **1 Claim**



A new fabric comprising yarns embedded in substantially unoriented thermoplastic polymer film with the yarns extending in the longitudinal direction of the fabric. Adjacent yarns are connected to each other by transversely oriented film areas preferably in the form of filaments or fibers. My new fabric is manufactured by placing an unoriented film on each side of a set of yarns and heating the laminate to combine the yarns and film. The laminate is transversely stretched to orient the film between the yarns into a plurality of highly molecularly oriented areas.

3,832,257

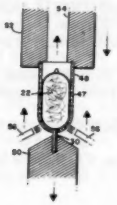
METHOD OF COATING PHOTOFLASH LAMP

Warren H. Hay, South Hamilton, Mass., assignor to GTE Sylvania Incorporated

Filed Sept. 15, 1972, Ser. No. 289,446

Int. Cl. B29c *17/00*

U.S. Cl. 156—198 **14 Claims**



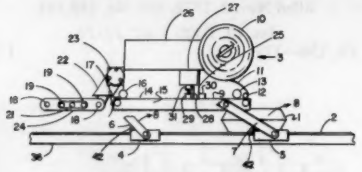
A method of coating the glass envelope of a photoflash lamp with a thermoplastic material, the method comprising: applying a thin film of mold release on the exterior surface of the glass envelope; locating the film coated glass envolpe in a dried, preformed sleeve of thermoplastic material; drawing a vaccum in the space between the sleeve and the envelope; heating the assembly incrementally lengthwise to gradually form the sleeve onto the envolpe; constricting and tipping off the sleeve at the conclusion of the heating process; and after the glass and thermoplastic have cooled, heating a narrow band of the thermoplastic coating longitudinally and/or circumferentially to relieve the stresses in the thermoplastic coating and thereby predictably control the compressive loading on the glass envelope of the lamp.

3,832,258

METHOD AND APPARATUS FOR APPLYING FILM-LIKE MATERIAL TO OBJECTS

John T. Roberts, Simpsonville, S.C., and John G. Waller, College Park, George E. Harris, Marietta, and Richard L. Ovrick, Chamblee, Ga., assignors to W. R. Grace & Co., Duncan, S.C.

Filed June 14, 1972, Ser. No. 262,886
Int. Cl. B32b *31/00*
U.S. Cl. 156—257 5 Claims



This invention is a method and apparatus for applying film-like material to objects, particularly thermoplastic film segments such as printed labels to planar objects such as egg carton lids. The method comprises the steps of conveying an object in a predetermined path; placing the free end of a length of film in the path of the object; wedging said free end between a movable surface and the object to grip the film therebetween; and, continuing the conveying of said object in contact with said movable surface until the desired length of film has been applied to the surface. Preferably, the film-like material is heat-shrinkable with a heat activated adhesive applied to one surface thereof, and the movable surface is heated to activate the adhesive thereby bonding the film material to the carton. The film is severed between cartons.

In one embodiment, the film is applied across a cavity in the surface of the object and heat bonded to each side of the cavity. While being heat bonded, the film also is heat shrunk, thus stretching it tightly across the cavity.

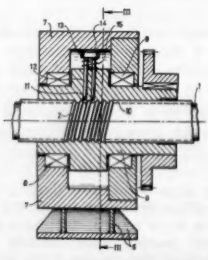
In the apparatus, the movable surface is a driven, heated belt which contacts the object for a sufficient period of time to heat bond and heat shrink the film.

3,832,259

METHOD FOR MANUFACTURING A TRANSVERSELY OR HELICALLY GROOVED PLASTIC TUBE WITH A SMOOTH INNER WALL

Cornelis van Zon, Zwolle, Netherlands, assignor to Industeiele Ondeeneming Wavin N.V., Zwolle, Netherlands

Continuation-in-part of abandoned application Ser. No. 860,205, Sept. 23, 1969. This application Jan. 10, 1972, Ser. No. 216,587
Claims priority, application Netherlands, Sept. 30, 1968, 6813975
Int. Cl. B29d *3/00*
U.S. Cl. 156—293 6 Claims



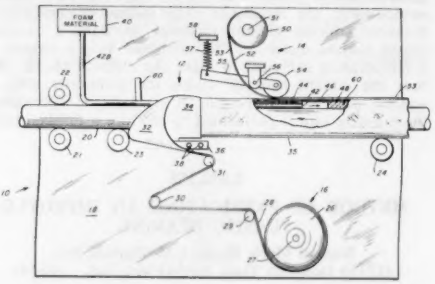
The invention relates to a method of manufacturing a composite plastic tube whereby an inner plastic tube with a smooth inner wall is positioned into an outer plastic tube provided with transverse or helical grooves and pins are acting upon part of the valleys of the outer tube. In this way the inner and outer tube are deformed and connected in a non-slidable way.

3,832,260

METHOD AND APPARATUS FOR SIMULTANEOUSLY APPLYING TO AN EXTENDED CYLINDRICAL OBJECT A COATING AND A PLASTIC FILM WRAPPING TO RETAIN THE COATING

Clemens F. Straughan and Charles A. Schad, Tulsa, Okla., assignors to CFS Corporation, Tulsa, Okla.

Continuation-in-part of application Ser. No. 142,452, May 12, 1971. This application May 17, 1972, Ser. No. 253,943
Int. Cl. B29f *1/10*
U.S. Cl. 156—390 19 Claims



This invention describes a method of placing a coating of material circumferentially about an extended cylindrical object and holding the material in place by means of a longitudinally folded and sealed plastic coating. This is accomplished by folding and wrapping a plastic film about the long object. The diameter of the resulting plastic cylinder is greater than that of the object, so as to provide sufficient space in the annulus for the coating material. The two edges of the plastic are sealed either by cementing one to the other or by applying a sealing strip over the edges. The coating material is applied into the annulus through a pipe between the object and the film cylinder. By the use of a heat shrinkable plastic film the film can be shrunk to tightly fit the coating material.

3,832,261

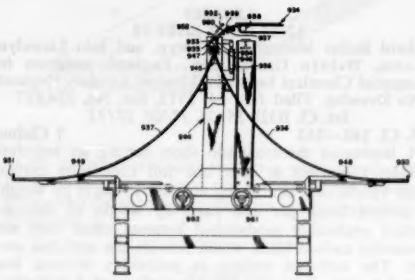
MATERIALS HANDLING ASSEMBLY

Wilhelm Brey, Cuyahoga Falls, Ohio, William Hostetler, Santa Ana, Calif., and Earl Ferdnand Loeffler, Akron, Hubert Ernest Kolm, Louisville, and Fred Grove Elder, Atwater, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Original application Feb. 11, 1970, Ser. No. 10,579, now U.S. Patent No. 3,700,526. Divided and this application Sept. 15, 1971, Ser. No. 180,833
Int. Cl. B29h *17/28;* B60c *9/14*
U.S. Cl. 156—405 2 Claims

A fully automatic machine for producing "green tires" or unvulcanized tire carcasses, especially suitable for making tubeless tires. The machine comprises a plurality of interconnected and dependent assemblies or stations where specialized operations, normally done semi-automatically or by hand, are carried out by mechanical devices acting in sequence. The machine includes a plurality of conventional tire building drums continuously moving between horizontally disposed, stationary table assemblies where innerliner and chafer strips, and first

and second ply material are successively wrapped on the drums as they move across the table on which the material is positioned. The wrapped drums from these assemblies, are sent to turret units where they are arcuately positioned for receiving beads, tread cushion,

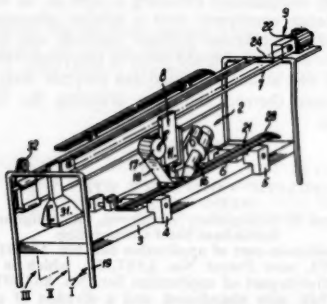


stitching, strips of whitewall, if required, and are discharged from the collapsed drums for removal and storage. The stripped drums, or drums from which tires are removed, are automatically expanded and recycled through the assemblies for building more tire carcasses.

3,832,262
APPARATUS FOR RENOVATING SKIS

Gerard Rene Rubaud, Megeve, Haute-Savoie, France, assignors to International Ski Service Establishment, Vaduz, Liechtenstein

Filed Mar. 7, 1972, Ser. No. 232,444
Claims priority, application France, Nov. 24, 1971, 7142772
Int. Cl. B32b *1/10*
U.S. Cl. 156—468 **6 Claims**

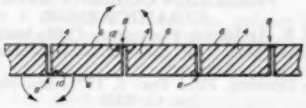


Apparatus for renovating the grooved soles of skis, comprises a holder for the ski with the sole of the ski up and exposed and a slideway guiding a carriage for movement parallel to and above the ski. The carriage has two relatively vertically movable supports, the forward support mounting a first roller and a hot air blower, the second or rear support mounting a second roller which is contoured like ski sole and spring-urged downwardly and a roll for a strip of plastic material. As the carriage moves along the ski sole, the blower heats the region of application of the strip to the sole and the strip of plastic is trained about the forward roll and under the contoured roll, which apply the new strip to the heated ski to bond them together. The contoured roll has a medial rib of rubber to press the new strip into the medial groove along the ski sole.

3,832,263
THERMAL INSULATING BARRIER OF CELLULAR POLYMER BLOCKS

Bruce B. Cleveland, San Pedro, and Thomas P. Dougan, Corona Del Mar, Calif., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of abandoned application Ser. No. 141,775, May 10, 1971. This application Mar. 26, 1973, Ser. No. 344,888
Int. Cl. B32b *3/16, 31/10*
U.S. Cl. 161—37 **1 Claim**

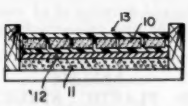


A thermal insulating barrier is provided which can be folded into compact form for transportation, and which is especially useful in fabricating foundations for roads, runways, buildings and the like, on permafrost or any terrain which is subject to periodic thawing. The barrier comprises a plurality of rigid cellular polymer blocks each of which is encased in a form-fitting envelope of water-impervious film (e.g. polyethylene). The skin covered blocks are joined one to another by, for example, heat welding the edge of skin along the longitudinal edges of one block to the corresponding skin edge on the neighboring blocks. The connections between blocks serve to hold them in parallel relationship but also act as hinges about which the barrier can be folded into compact form. In a preferred embodiment, the rigid cellular polymer blocks are substantially rectangular and the blocks are joined via the skin at diametrically opposed edges. The resulting barrier can then be folded in accordion pleat-like fashion into a compact portable form for transportation.

3,832,264
SELF-REINFORCED PLASTIC ARTICLES WITH CORE ENVELOPMENT

Stanley Ronald Barnette, 90 Cherokee St., Miami Springs, Fla. 33166

Continuation of abandoned application Ser. No. 648,728, June 26, 1967, which is a division of Ser. No. 254,851, Jan. 14, 1963, now Patent No. 3,328,500, which in turn is a continuation-in-part of Ser. No. 808,599, Apr. 24, 1959, now Patent No. 3,072,973. This application Feb. 5, 1971, Ser. No. 113,099
Int. Cl. B32b *3/10*
U.S. Cl. 161—41 **14 Claims**



An ornamental panel comprising at least a first and second layer of resinous material adhered together, a plurality of relatively rigid blocks of core media material encased between said layers, at least one of said layers having particles intermixed therein, and wherein chips substantially larger than said particles embedded in the exterior surface.

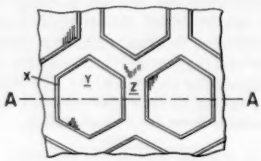
3,832,265
BALLISTIC ARMOR OF PLIES OF NYLON FABRIC AND PLIES OF GLASS FABRIC
Maurice R. Denommee, Franklin, Mass., assignor to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Sept. 20, 1973, Ser. No. 399,772
Int. Cl. D03d *11/00*
U.S. Cl. 161—92 **7 Claims**

An armor material formed of a plurality of plies of woven nylon ballistic fabric and a plurality of plies of woven roving fiberglass fabric bonded together with a polyester resin to produce a dimensionally stable, lightweight, ballistic-resistant material.

3,832,266
FIBERGLASS LAMINATE BACKED CERAMIC ARMOR
Paul B. Archibald, Pleasanton, Calif., assignor to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Dec. 5, 1972, Ser. No. 312,398
Int. Cl. B32b *7/00*
U.S. Cl. 161—93 **2 Claims**

A fiberglass laminate which may be utilized in conjunction with a ceramic as a backing material, constructed of commercially available fiberglass cloth having a temporary or compatible size, and having applied in addition thereto a small amount of a silicone oil finish.

3,832,267
EMBOSSED FILM
Chia-Seng Liu, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Sept. 19, 1972, Ser. No. 290,309
Int. Cl. B29g *7/24*
U.S. Cl. 161—116 **3 Claims**



Embossed, biaxially oriented propylene polymer films having great tear strength for their thickness can be prepared if certain critical limitations are followed. The process comprises embossing a sheet of propylene polymer having a crystallinity of from about 40% to 65% and containing at least 80% of repeating units derived from propylene monomer to a depth of from about 50% to 75% of its thickness with at least 4 but not more than 600 uniform raised bosses per square inch, each boss enclosed by a raised lip, the valley areas separating individual bosses constituting from about 20% to 40% of the surface of the embossed film and subjecting the thus embossed film to biaxial drawing of at least 2.5 to 5.0 times in both the machine and cross-machine directions.

3,832,268
REINFORCED PLASTIC STRUCTURES CONTAINING CURED POLYESTER RESIN
Clarence R. Smith, Penndel, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.
No Drawing. Continuation-in-part of abandoned application Ser. No. 218,463, Jan. 17, 1972. This application Apr. 17, 1972, Ser. No. 244,892
Int. Cl. B32b *5/16, 17/04, 27/08*
U.S. Cl. 161—162 **3 Claims**

Reinforced plastic structures are formed from thermoplastic substrates having bonded thereto a cured polyester of a composition comprising an ethylenically unsaturated curable polyester and a monomer mixture of a copolymerizable unsaturated carboxylic acid or anhydride and a different copolymerizable monomer. The plastic structures are characterized by improved bonding between the substrate and cured polyester.

3,832,269
ANTI-DUST SHEETS
Richard Butler Macmillan, Welwyn, and Iolo Llewelyn Lewis, Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed July 24, 1972, Ser. No. 274,617
Int. Cl. B32b *15/08, 27/08, 27/32*
U.S. Cl. 161—162 **7 Claims**

A laminated thermoplastic sheet having an anti-dust surface, comprises at least one foil containing carbon black (preferably containing at least 10 parts by weight of carbon black per 100 parts by weight of thermoplastic) preferably sandwiched between other foils not containing carbon black which provide the anti-dust surface. The anti-dust surface is preferably situated less than 2.3 mm. from the nearest surface of a foil containing carbon black. The invention is particularly useful for poly(vinyl chloride) sheeting.

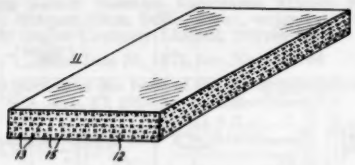
3,832,270
HEAT SHRINKAGE, ORIENTED LAMINATED PLASTIC FILM
Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.
Application Mar. 23, 1970, Ser. No. 21,793, now Patent No. 3,754,063, which is a continuation-in-part of applications Ser. No. 659,940, Aug. 11, 1967, now Patent No. 3,607,505, and Ser. No. 768,955, Sept. 23, 1968, now Patent No. 3,808,304, which is a continuation of abandoned application Ser. No. 355,522, Mar. 18, 1964. Divided and this application Dec. 4, 1972, Ser. No. 312,247
Int. Cl. B32b *27/30*
U.S. Cl. 161—165 **4 Claims**

A laminated, tubular, thermoplastic film having excellent packaging and shipping abuse characteristics produced by continuously extruding a layer of an ethylene vinyl acetate copolymer onto a tubular substrate of a predominantly ethylene polymer material and continuously extruding an admixed isotactic polypropylene, polybutene-1 and atactic polypropylene polymer layer as the outer layer thereon and then orienting the resulting laminate.

3,832,271
PLASTIC COMPOSITE WITH WIRE REINFORCEMENTS
Darral V. Humphries, Allentown, Pa., assignor to Bethlehem Steel Corporation
Continuation-in-part of application Ser. No. 132,017, Apr. 7, 1971, now Patent No. 3,687,798, which is a continuation-in-part of application Ser. No. 853,071, Aug. 26, 1969, now abandoned, and a division of application Ser. No. 247,390, Apr. 25, 1972, which in turn is a division of application Ser. No. 854,721, Sept. 2, 1969, now abandoned. This application Aug. 28, 1972, Ser. No. 284,196
Int. Cl. B32b *5/16*
U.S. Cl. 161—170 **21 Claims**

A wire fiber reinforced plastic composite is formed from a styrene type resin such as polystyrene or acrylonitrile-butadiene-styrene (ABS) resin and thin ferrous metal wires or fibers. The ferrous wires or fibers are prevented from corroding at the surface of the plastic by the povision of either sacrificial wires formed from a metal such as zinc, or alternatively, ferrous wires coated with a sacrificial metal such as zinc. The ferrous wires are prevented from corroding in the interior of the composite by a tight adherent bond formed between the sur-

face of the ferrous wires and the styrene or ABS resin by a binder of ABS resin between the ferrous metal and the plastic matrix. The tight bonding of the ferrous wires



to the matrix plastic also enables a very smooth surface finish to be attained upon the finished plastic articles. In some cases the sacrificial metal may not be included in the composite.

3,832,272

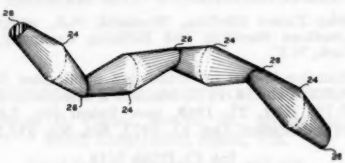
FILAMENTS OF VARYING CROSS-SECTIONAL AREA

Paul D. Hann, Bartlesville, Okla., assignor to Phillips Petroleum Company

Application June 25, 1970, Ser. No. 49,739, now Patent No. 3,647,330, which in turn is a division of application Ser. No. 560,714, June 27, 1966, now Patent No. 3,538,206. Divided and this application Nov. 15, 1971, Ser. No. 198,761

Int. Cl. D02g *3/22*

U.S. Cl. 161—173 **2 Claims**



Filaments are produced having a cross section which varies along the length thereof, for example, filaments having a cross section alternating between circular and marquise.

3,832,273

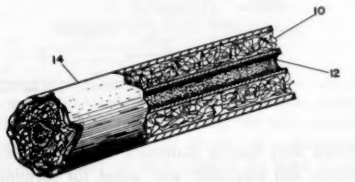
COMPOSITE REFRACTORY ARTICLES

Michael P. O'Connor, Jr., Livonia, Mich., assignor to The Carborundum Company, Niagara Falls, N.Y.

Filed May 15, 1972, Ser. No. 253,482

Int. Cl. B32b *1/08, 15/14*

U.S. Cl. 161—182 **1 Claim**



The invention provides a porous, fibrous substrate and composite refractory articles in which the substrate serves as a re-enforcement against thermal and shock stresses. The substrate is made from refractory inorganic fibers, the substrate serving as a base for the deposition of a suitable layer of refractory material which may be applied by any of several known methods. The substrate and adhering refractory layer may then be dried together to produce a composite refractory article or the dried article may be fired to give a composite article with a densified refractory layer. In either case the substrate remains firmly attached to the refractory layer and functions as a mechanical re-enforcing and thermal insulating substrate for the resulting composite refractory article. The articles may be further strengthened by providing a layer of re-enforcing metal over the outer surface of the composite article. The metal layer may be a casting or a sheet metal casing shaped to enclose and provide support for the article at its point of use.

3,832,274

FAST CURING ADHESIVES

William J. Owston, Edinboro, Pa., assignor to Lord Corporation, Erie, Pa.

No Drawing. Filed June 6, 1973, Ser. No. 367,506

Int. Cl. C08c *11/12, 11/18;* **C08f** *15/04*

U.S. Cl. 161—183 **28 Claims**

Improved, fast curing, flexible industrial adhesives with and without fillers, and articles bonded therewith, are described which adhesives comprise (A) about 1 to about 30% of an elastomeric polymer selected from the group consisting of (1) poly(butadiene) homopolymer, (2) a copolymer of butadiene with at least one copolymerizable monomer selected from the group consisting of styrene, acrylonitrile and methacrylonitrile, and (3) a copolymer of butadiene selected from the group consisting of homopolymer (1) and copolymers (2) modified by inclusion in the polymer of trace amounts up to about 5% of a functional monomer; (B) about 25 to about 85% of at least one polymerizable acrylic monomer selected from the group consisting of the acrylates, methacrylates, acrylonitrile and methacrylonitrile; (C) from 0 to about 50% of at least one ethylenically unsaturated non-acrylic monomer; (D) from 0 to about 60% of a polymer having an intrinsic viscosity in the range from about 0.1 to about 1.3 derived from at least one of said (B) and (C) monomers; (E) from about 5 to about 20% of methacrylic acid and (F) about 0.04 to about 4% of the reducing component of a redox catalyst polymerization system; said adhesives being compounded by selecting ingredients and proportions within the foregoing limits to produce a composition having a handleable cure time of not more than about 15 minutes and which is preferably within the range from about 4 to about 12 minutes.

3,832,275

LAMINATE AND METHOD OF PREPARATION

Paul R. Matvey, Akron, and John R. Gage, Stow, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,069

Int. Cl. B32b *27/40*

U.S. Cl. 161—190 **4 Claims**

A composite of a vulcanized diene rubber with a low vapor transmission layer having a polyurethane outer layer suitable for use in making containers where the container is to be subjected to a wide range of temperature variation and it is needed to protect materials such as powder from moisture and other deleterious substances.

3,832,276

DELIGNIFICATION AND BLEACHING OF A CELLULOSE PULP SLURRY WITH OXYGEN

Sunanda K. Roymoulik, Newburgh, and Kenton J. Brown, Suffern, N.Y., assignors to International Paper Company, New York, N.Y.

Filed Mar. 7, 1973, Ser. No. 338,862

Int. Cl. D21c *9/10*

U.S. Cl. 162—65 **15 Claims**

Cellulose pulp is continuously bleached and delignified by oxygen, without requiring the use of a cellulose de-

polymerization protective agent, whereby an alkaline aqueous pulp slurry of a consistency of from about 2 to 10%, having a pH of between about 9 and 14, a reaction temperature of between about 70° and 120° C., with the oxygen dissolved and intimately dispersed and subdivided into the slurry so that no agglomerated bubbles are formed and the oxygenated pulp slurry has substantially no bubbles exceeding about 1/16 inch in diameter, and thereafter continuously introducing the slurry into the lower region of a vertical elongated tower and flowing the slurry upwardly through the tower without any substantial agitation, so as to gradually decrease the pressure to which the slurry is subjected and continuously withdrawing treated slurry from the upper region of said tower.

3,832,277

HYDROXYLAMINE TREATED HEMICELLULOSE-CONTAINING REGENERATED CELLULOSE PRODUCT

Frederick R. Smith, Wilmington, Del., and Joseph W. Schappel, Morton, Pa., assignors to FMC Corporation, Philadelphia, Pa.

No Drawing. Filed Feb. 24, 1972, Ser. No. 229,193

Int. Cl. D21c *9/00*

U.S. Cl. 162—70 **6 Claims**

A hemicellulose-containing cellulose product treated with hydroxylamine or a hydroxylamine salt to reduce yellowing when the cellulose product is heated to a temperature above 100° C. A specific examples of said cellulose product is a hemicellulose-containing regenerated cellulose product.

3,832,278

PREHYDROLYSIS AND DIGESTION OF BAGASSE FIBERS

Eduardo J. Villavicencio, New York City, N.Y., assignor to Process Evaluation and Development Corporation, New York, N.Y.

No Drawing. Original application June 1, 1971, Ser. No. 149,000, now Patent No. 3,738,908. Divided and this application Feb. 28, 1973, Ser. No. 336,493

The portion of the term of the patent subsequent to June 12, 1990, has been disclaimed

Int. Cl. D21c *3/00, 3/12*

U.S. Cl. 162—80 **1 Claim**

Pulp, suitable for production of newsprint, is prepared from sugarcane bagasse by controlled prehydrolysis under acid conditions followed by digestion under alkaline conditions in the presence of an alkali metal bisulfite and thereafter adding to the pulp, prior to blowdown, sufficient amounts of alkali metal silicate.

3,832,279

INTEGRATED KRAFT PULPING PROCESS, INCLUDING HYDROGEN SULFIDE PRETREATMENT OF WOOD CHIPS AND SULFUR DIOXIDE TREATMENT OF BLACK LIQUOR TO LOWER pH THEREOF PRIOR TO COKING

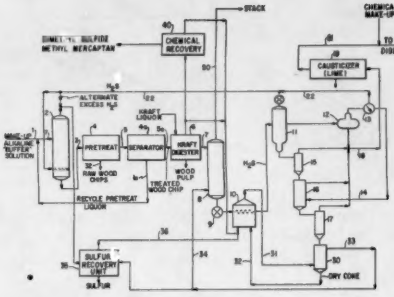
Howard V. Hess, Glenham, Edward L. Cole, Fishkill, and William F. Franz, Gardiner, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Aug. 7, 1972, Ser. No. 278,681

Int. Cl. D21c *3/00*

U.S. Cl. 162—82 **9 Claims**

Disclosed is an improved and integrated Kraft pulping process wherein the wood chips are pretreated in an alkaline "buffer" medium containing H_2S at a partial pressure of about 90 to 110 p.s.i.g. at about 260° F. The hydrogen sulfide is produced by coking in the liquid phase a spent Kraft pulping liquor that has been made acid with absorbed SO_2. This SO_2 is generated by burning sulfur-



containing coke resulting from coking the acid spent Kraft liquor.

3,832,280

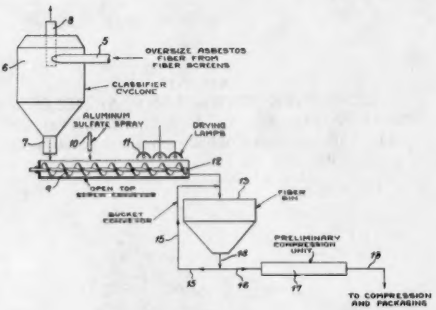
COATING ASBESTOS FIBER WITH ALUMINUM SULFATE PRIOR TO FORMING A CEMENT-ASBESTOS SLURRY FROM THE TREATED FIBERS TO ENHANCE THE FILTERING CHARACTERISTICS OF THE SLURRIES

Charles Ernest Stiefken, Westfield, N.J., assignor to American Smelting and Refining Company, New York, N.Y.

Continuation-in-part of abandoned application Ser. No. 226,218, Feb. 14, 1972, which is a division of Ser. No. 869,754, Oct. 27, 1969, now Patent No. 3,644,138. This application Apr. 23, 1973, Ser. No. 353,259

Int. Cl. D21h *5/18*

U.S. Cl. 162—154 **4 Claims**



Asbestos fiber having aluminum sulfate deposited on its surfaces and especially well suited for forming fast-filtering asbestos-cement slurries, the preparation of such fiber, and the production of water-laid asbestos-cement products involving the formation of the fast-filtering asbestos-cement slurries utilizing the asbestos fiber having the aluminum sulfate previously deposited thereon. Such asbestos fiber product is preferably dry but can be only partially dry or wet.

3,832,281

PAPER OR NON-WOVEN FABRIC OF REGENERATED CELLULOSE FIBERS AND METHOD FOR PRODUCING THE SAME

Atsushi Kawai; Takehiro Katsuyama, Migaku Suzuki, and Hidenori Ohta, Otake, Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Filed June 30, 1972, Ser. No. 267,994

The portion of the term of the patent subsequent to Feb. 27, 1980 has been disclaimed

Int. Cl. D21h *1/30*

U.S. Cl. 162—157 C 1 Claim

A method is provided for producing a paper or nonwoven fabric of regenerated cellulose fibers which product is composed of film state parts and fiber state parts. The method comprises generally the steps of:

(a) dispersing spun and stretched viscose fibers comprising hydroxymethyl cellulose xanthate (HMCX) in an aqueous medium,
(b) forming the dispersed fibers into a web by a wet forming method,
(c) dehydrating the web to the extent that the water content of the web becomes lower than 700%,
(d) subjecting at least a portion of the surface of dehydrated web to pressure thereby fusing and decomposing the HMCX in the pressed portions and simultaneously bonding the fibers in the portions to each other, and
(e) subjecting the pressed web to a regeneration treatment to decompose the remaining HMCX into cellulose.

3,832,282

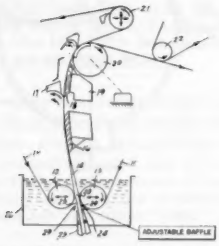
SUBMERGED TWIN WIRE PAPER FORMER

Joseph D. Parker, Roscoe, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 6, 1971, Ser. No. 187,062

Int. Cl. D21f *1/00, 1/06, 1/08*

U.S. Cl. 162—203 10 Claims



A twin wire paper web forming machine wherein the wires are guided into a forming throat over breast rolls and then into a forming run with the slice opening delivering a stock jet into the throat and a container containing white water on both sides of the stock jet so as to submerge it and maintain water on the offrunning side of the breast rolls. The basis weight profile can be controlled by adding to or interfering with the stock jet before it enters the throat. This is accomplished by employing an additional stock jet or placing adjustable baffles in a position to block a portion of the jet and reduce its thickness.

3,832,283

METHOD FOR PRODUCING NONWOVEN FABRICS

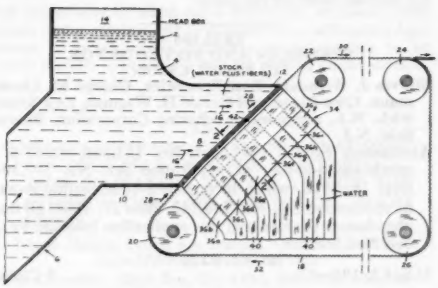
Thomas S. Bartley, Mobile, Ala., and John Gilbert Descary, Lachine, Quebec, R. James Futcher, Beaconsfield, Quebec, and R. Gopala Krishnan, Montreal, Quebec, Canada, assignors to International Paper Company, New York, N.Y.

Continuation of application Ser. No. 164,499, July 21, 1971, now Patent No. 3,764,465, dated Oct. 9, 1973. This application Aug. 15, 1973, Ser. No. 388,438

The portion of the term of the patent subsequent to Oct. 9, 1990, has been disclaimed

Int. Cl. D21f *11/02*

U.S. Cl. 162—211 1 Claim



A method for making nonwoven fabrics wherein water and fiber stock is delivered to a Fourdrinier wire moving endlessly through a stock tank, the fibers being deposited on the wire in a forming zone and the water passing through said wire into a suction box comprising a plurality of adjacent and individually controlled compartments, each of said compartments having a bottom sloping in a direction transverse to the direction of travel of said wire and each of said compartments having a flow restricting device such as a baffle mounted therein, wherefor a substantially uniform pressure differential through the moving wire across its width is obtained so as to result in an even deposit of fibers thereon.

3,832,284

METHOD FOR MANUFACTURE OF α-GALACTOSIDASE BY MICROORGANISMS

Hideo Suzuki, Harumi Kobayashi, Yoshiko Ozawa, and Akira Kamibayashi, Chiba, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

No Drawing. Filed Mar. 30, 1972, Ser. No. 239,741

Int. Cl. C12d *13/10;* C13j *1/00*

U.S. Cl. 195—11 6 Claims

Mycelia having strong α-galactosidase activity and very weak invertase activity are obtained by culturing a mold belonging to the genus Absidia in a culture medium incorporating therein at least one member selected from the group consisting of lactose, melibiose, raffinose and galactose. When beet molasses is treated with the said mycelia, raffinose contained in the molasses is decomposed into sucrose and galactose. Thus, the yield of sucrose can be increased.

3,832,285
METHOD OF PRODUCING MALTOSE OF HIGH PURITY

Masashi Kurimoto, Okayama, Japan, assignor to Hayashibara Biochemical Laboratories Incorporated, Okayama, Japan

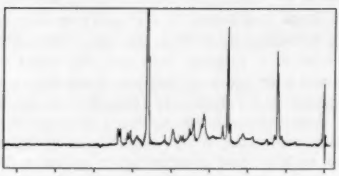
No Drawing. Filed May 24, 1972, Ser. No. 256,364
Claims priority, application Japan, May 31, 1971, 46/36,968
Int. Cl. C12b *1/00*
U.S. Cl. 195—31 R **5 Claims**

Very pure maltose is obtained from starch predominantly consisting of amylopectin by reaction with β-amylase free from significant amounts of α-amylase, maltase, glucamylase, and isoamylase, dialysis of the reaction mixture through a membrane having an effective pore size of 5 A. to 30 A. against pure water before significant amounts of trisaccharides or oligosaccharides of lower molecular weight are formed, and recovering the maltose from the dialyzate.

3,832,286
SISOMICIN AND METHODS FOR ITS PRODUCTION

Marvin J. Weinstein, East Brunswick, George M. Luedemann, Glen Ridge, and Gerald H. Wagman, East Brunswick, N.J., assignors to Schering Corporation, Bloomfield, N.J.

Application Feb. 3, 1971, Ser. No. 112,368, which is a continuation-in-part of application Ser. No. 797,304, Dec. 16, 1968, which in turn is a continuation-in-part of application Ser. No. 740,742, June 27, 1968, all now abandoned. Divided and this application June 26, 1973, Ser. No. 373,838
Int. Cl. C12b *1/00*
U.S. Cl. 195—80 **5 Claims**



Antibiotic 66–40, a new broad spectrum antibiotic having an adverse effect upon the growth of Gram-positive and Gram-negative bacteria is described together with its method of production via the fermentation of *Micromonospora inyoensis*, a new species of *Micromonospora*.

3,832,287
DIPEPTIDE ANTIBIOTIC AND METHOD FOR THE PRODUCTION THEREOF

Richard M. Gale, and David H. Lively, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Original application Mar. 2, 1972, Ser. No. 231,386, now Patent No. 3,780,016, dated Dec. 18, 1973. Divided and this application July 5, 1973, Ser. No. 376,473
Int. Cl. C12b *1/00*
U.S. Cl. 195—81 **1 Claim**

Dipeptide antibiotic fumarylcarboxyamido-L-2,3- diaminopropionyl-L-alanine is produced by culturing the organism *Streptomyces collinus* NRRL 5332 under submerged aerobic fermentation conditions and is isolated by chromatography of the filtered fermentation broth over activated carbon, followed by chromatography of the active fractions obtained therefrom over acid-washed alumina. The antibiotic displays significant activity against *Salmonella gallinarum* and *Trichomonas vaginalis*.

3,832,288
ENTERIC BACILLI DIFFERENTIAL MEDIA

William Rollender, 272 Glen Ave., Sea Cliff, N.Y. 11579, and Orville A. Beckford, 853 E. 216th St., Bronx, N.Y. 10467

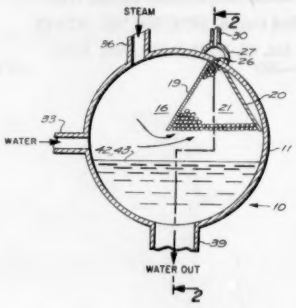
Continuation of application Ser. No. 14,805, Mar. 2, 1970, which is a continuation of application Ser. No. 624,810, Mar. 21, 1967, both now abandoned. This application May 24, 1973, Ser. No. 256,328
Int. Cl. C12k *1/10*
U.S. Cl. 195—139 **15 Claims**

A test media is provided for the positive identification of enteric bacilli by means of distinctive chemical and enzymatic reactions.

3,832,289
PREHEATERS

David D. Kays, Claremont, Kurt F. Frank, Pomona, and Paul A. Longwell, San Gabriel, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Continuation-in-part of abandoned application Ser. No. 10,233, Feb. 10, 1970. This application Dec. 3, 1971, Ser. No. 204,757
Int. Cl. C02b *1/06*
U.S. Cl. 202—174 **5 Claims**



A preheater for use in a multieffect distillation system comprising a housing having a plurality of chambers with a conduit means extending axially through each of the chambers for carrying feed liquor to a multiple effect evaporator. First inlet means is provided for introducing hot vapors into each of the chambers, second inlet means is provided for introducing superheated condensate into each of the chambers, and outlet means is provided for removing condensate from each of the chambers. The superheated condensate flashes to form more hot vapor which combines with the hot vapor introduced by the first inlet means. The combined vapor heats the conduit means which is, typically, a bundle of tubes. Baffle means is associated with the conduit means to maintain a high vapor velocity thereacross.

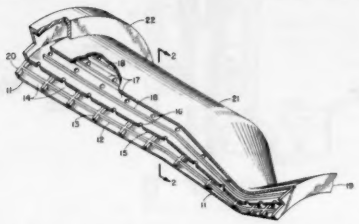
3,832,290
METHOD OF ELECTROFORMING A ROCKET CHAMBER

Anthony Fortini, Cleveland, Ohio, assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Sept. 14, 1972, Ser. No. 289,050

Int. Cl. C23b *7/02;* **F02k** *11/02*

U.S. Cl. 204—9 **7 Claims**



A transpiration cooled rocket chamber is made by forming a porous metal wall on a suitably shaped mandrel. The porous wall may be made of sintered powdered metal, metal fibers sintered on the mandrel or wires woven onto the mandrel and then sintered to bond the interfaces of the wires. Intersecting annular and longitudinal ribs are then electroformed on the porous wall. An interchamber wall having orifices therein is then electroformed over the annular and longitudinal ribs. Parallel longitudinal ribs are then formed on the outside surface of the interchamber wall after which an annular jacket is electroformed over the parallel ribs to form distribution passages therewith. A feed manifold communicating with the distribution passages may be fabricated and welded to the rocket chamber or the feed manifold may be electroformed in place.

3,832,291
METHOD OF PREPARING SURFACES FOR ELECTROPLATING

Donald A. Arcilesi, Detroit, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

No Drawing. Original application Aug. 20, 1971, Ser. No. 173,645, now Patent No. 3,751,289. Divided and this application Mar. 23, 1973, Ser. No. 344,101

Int. Cl. C23b *5/20*

U.S. Cl. 204—40 **1 Claim**

This invention relates to adherent copper films formed by immersion, or electrolytically on metallic objects from an aqueous solution of (1) a nonoxidizing acid, (2) a copper salt of a nonoxidizing acid, and (3) a polyether exhibiting at least 5 ether oxygen atoms per molecule; to processes for coating said films; and to compositions for the deposition of said adherent copper films.

3,832,292
CATALYTIC CATHODIC HARDENING OF OXIDE FILMS

William Heald Sutton, Stourbridge, Thomas Ernest Evans, Solihull, and Anthony Christopher Hart, Sedgley, England, assignors to The International Nickel Company, Inc., New York, N.Y.

No Drawing. Filed Oct. 30, 1972, Ser. No. 301,810

Claims priority, application Great Britain, Oct. 12, 1972, 47,048/72

Int. Cl. C23b *11/00*

U.S. Cl. 204—56 R **12 Claims**

Oxidic films on stainless steel and similar alloys formed by treatment of the alloys in aqueous solutions of sulfuric acid and pitting inhibiting oxidizing agents are hardened by being treated as cathodes in aqueous electrolytes containing hexavalent chromium and a substance capable of promoting the deposition of oxidic chromium deposits at the cathode in preference to chromium metal.

3,832,293
PROCESS FOR FORMING A COATING COMPRISING A SILICATE ON VALVE GROUP METALS

Rudolf J. Hradcovsky, Long Beach, and S. Heagan Bayles, Jr., Sands Point, N.Y., assignors to D & M Technologies, Inc., New York, N.Y.

Filed Mar. 1, 1973, Ser. No. 337,149

Int. Cl. C23b *9/02, 11/02*

U.S. Cl. 204—56 R **17 Claims**

Metals and alloys which have the property of electrolytic rectification are coated by immersion in an aqueous bath comprising an alkali metal hydroxide, an alkali metal silicate and a catalyst and application of a sufficiently high voltage to obtain spark discharge at the surface to be coated thereby to provide a durable coating on the surface.

3,832,294
ANTI-FERMENTATION AND NEUTRALIZING AQUEOUS SOLUTION FOR THE PURIFICATION OF WATERS, DRINKS AND/OR THE PRESERVATION OF LIQUID OR SOLID FOODS

Marie-Helene Praud nee Durupt, Domaine Sainte-Anne, 85190 Aizenay, France

No Drawing. Filed Jan. 24, 1973, Ser. No. 326,486

Int. Cl. C02b *1/18, 3/06*

U.S. Cl. 252—175 **2 Claims**

The present invention is directed to an anti-fermentation and neutralizing aqueous solution for the purification of waters, drinks and/or the preservation of liquid or solid foods. The components which are added together to form this solution are carefully selected and measured. These components comprise:

sulfur flour—S—in the amount of 5%;
magnesium oxide (roasted magnesia); MgO=15%;
sodium chloride—NaCl=50%;
20% pure ammonia—NH_3=20%;

Dilution in water to provide 1000 cc. The water used is a spring water which is particularly pure and which gushes in a specific location. The solution thus obtained possesses antiseptic, bactericidal properties and is an excellent antidote particularly against arsenious acids. The composition can also be used as a relaxing agent and also as a fertilizing agent when added to the sprinkling water used in gardening.

3,832,295
FUSED SALT ELECTROLYSIS TO OBTAIN MANGANESE METAL

Bruce E. Barton, Houston, Tex., and Paul H. Cardwell, Zanoni, Va., assignors to Deepsea Ventures, Inc.

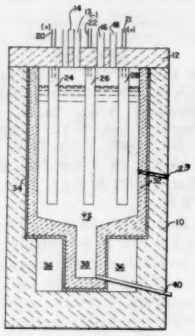
Filed Nov. 27, 1972, Ser. No. 309,624

Int. Cl. C22d *3/02, 3/18*

U.S. Cl. 204—64 R **12 Claims**

This invention provides a method for obtaining molten manganese metal by electrolysing a molten mixture of metal halides comprising a manganese halide and a bath mixture comprising a halide of a reactant metal, an alkali metal halide and an alkaline earth metal halide. Manganese metal is obtained in a molten phase below the molten mixture of metal halides and elemental halogen is evolved at the anode. The reactant metal is electrolytically re-

duced at the cathode. The anode and cathode are both inert and immersed in the molten mixture of metal halides. The halides are preferably chlorides, bromides or



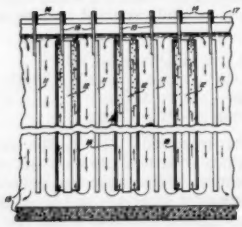
iodides. The reactant metal can be any cathodically reducible metal which can replace manganese from manganese halide in the molten salt bath, but is preferably aluminum or magnesium.

3,832,296

ELECTROWINNING CELL AND METHOD WITH PROVISION FOR ELECTROLYTE CIRCULATION

David L. Adamson, and William M. Tuddenham, Salt Lake City, Utah, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Aug. 7, 1972, Ser. No. 278,220
Int. Cl. C22d *1/02, 1/16*
U.S. Cl. 204—106 **8 Claims**



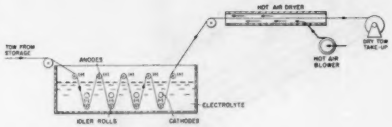
An electroyltic cell and method for electrowinning metal values, such as copper, from an electrolyte solution. Each of the anode electrodes of the cell is surrounded by a porous shield, preferably constructed of a material known as plastic frit. Each shield is open at top and bottom, to provide, in effect, a chimney around the anode, extending upwardly from a point above the cell bottom to a point below the surface of electrolyte solution in the cell. The oxygen evolved at the surface of the insoluble anode during operation of the cell rises upwardly in the electrolyte within the shield and induces upward flow of such electrolyte, resulting in circulation thereof from bottom to top of the cell within the shield and from top to bottom of the cell exteriority of the shield. The electrolyte flows upwardly in close proximity to the anode, over the top of the shield, and downwardly across the face of the adjacent cathode, thereby maintaining a high concentration of available metal ions at the cathode-solution interface to improve deposition quality and to achieve higher current density in the cell. The porosity of the shield permits ions in the electrolyte to pass through the shield in either direction, thereby avoiding excessive ohmic resistance between the electrodes.

3,832,297

PROCESS FOR ELECTROLYTIC TREATMENT OF GRAPHITE FIBERS

James T. Paul, Jr., Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 9, 1973, Ser. No. 339,694
Int. Cl. B01k *1/00*
U.S. Cl. 204—130 **13 Claims**



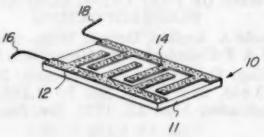
This invention is an improved process for the electrolytic surface treatment of graphite fiber. In the process of of this invention organic or inorganic ammonium compounds which are water-soluble and which decompose to gaseous products below about 250° C. are employed. Residual material present in the fiber surface following electrolytic treatment is easily removed by heating of the fiber to volatilize residual material.

3,832,298

METHOD FOR PRODUCING A PHOTOCONDUCTIVE ELEMENT

Armin K. Weiss, and Robert G. Spahn, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 5, 1972, Ser. No. 259,705
Int. Cl. C23c *15/00*; G03g *5/00*
U.S. Cl. 204—192 **10 Claims**



A photoconductive element can be formed by sputtering doped or undoped orthorhombic and tetragonal lead monoxide layers onto a support from a powdered target within an atmosphere of reduced pressure. The product produced has essentially no fatigue, low dark conductivity, high spatial frequency response and microsecond response when exposed to activating radiation.

3,832,299

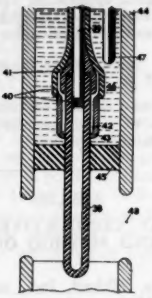
GAS DETECTING ELECTRODE ASSEMBLY

Imanuel Bergman, Sheffield, England, assignor to National Research-Development Corporation, London, England

Continuation of abandoned application Ser. No. 839,887, July 8, 1969. This application Mar. 30, 1972, Ser. No. 239,440
Claims priority, application Great Britain, July 18, 1968, 34,237/68
Int. Cl. G01n *27/30, 27/46*
U.S. Cl. 204—195 P **9 Claims**

An electrical cell with a non-porous gas-permeable membrane having a large surface area for forming an interface with a liquid containing a dissolved gas com-

municating with a membrane electrode, whose effective area is small when compared with the surface area of the



gas-permeable membrane, so that gas can pass from the membrane to the electrode.

3,832,300

BIPOLAR DIAPHRAGM ELECTROLYZER WITH CATHODE WAVES IN HORIZONTAL PLANE

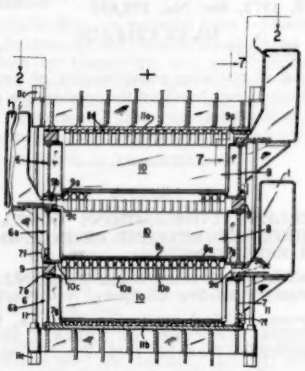
Georg Messner, 7 Latemar Strasse, 8000 Munich, 90, Germany, Oronzio de Nora, Piazza della Repubblica 19, Milan, Italy, and Vittorio de Nora, Sandringan House, Nassau, Bahama Islands

Filed Oct. 3, 1972, Ser. No. 294,034

Claims priority, application Italy, Nov. 9, 1971, 30,858/71

Int. Cl. B01k *3/10*

U.S. Cl. 204—256 20 Claims



Describes a bipolar electrolysis cell with diaphragm covered steel cathodes in wave form mounted substantially horizontally in cathode frames and with dimensionally stable valve metal anode blades or waves extending into each of the cathode waves and forming an electrolysis gap therebetween, and bipolar connections between the valve metal anode supporting plates and the steel cathode wave supporting plates.

3,832,301

POLYMERIC SOLVENT COMPOUNDS FOR CHANGING THE SALT CONCENTRATION OF WATER

Leon Lazare, Stamford, Conn., and Stephen Z. Jakabhazy, Weston, Mass., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Sept. 22, 1972, Ser. No. 291,233

Int. Cl. B01d *11/00*

U.S. Cl. 210—21 9 Claims

Novel polymeric solvent compounds and their use for changing the salt concentration of water are herein described.

3,832,302

METHODS FOR INHIBITING SCALE FORMATION

Robert W. Lansford and Tommy R. Gardner, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

No Drawing. Filed Jan. 17, 1972, Ser. No. 218,597

Int. Cl. C02b *5/06*

U.S. Cl. 210—58 18 Claims

A composition for inhibiting scale and methods of using said composition consisting of a relatively water-insoluble organic precipitate formed by the reaction of a water-soluble polyelectrolytic organic polymer having an average molecular weight in the range of from about 1,000 to about 100,000 and a water-soluble organic cationic surface active compound.

3,832,303

POLYPHENYL THIOETHER LUBRICATING COMPOSITIONS

Frank S. Clark, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Original application Dec. 30, 1970, Ser. No. 102,969, now Patent No. 3,748,269, dated July 24, 1973. Divided and this application Feb. 5, 1973, Ser. No. 329,954

Int. Cl. C10m *1/48*

U.S. Cl. 252—46.6 2 Claims

Lubricating compositions comprising polyphenyl thioethers, polyphenyl ethers-thioethers or mixtures thereof and containing small amounts of a polar organic compound and an organic phosphinic acid or ester have improved lubricating properties. These compositions are useful as lubricants over wide temperature ranges.

3,832,304

HYDROCRACKED LUBES STABLIZED WITH AROMATIC AZO COMPOUNDS

George Suld, Springfield, Pa., assignor to Sun Research and Development Co., Philadelphia, Pa.

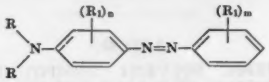
No Drawing. Filed Mar. 3, 1972, Ser. No. 231,749

Int. Cl. C10m *1/32*

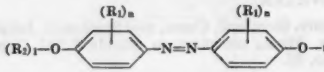
U.S. Cl. 252—51.5 A 12 Claims

The light stability of hydrocracked lube oils is improved by incorporating therein a minor amount such as from

0.05 to 0.20 wt. percent of certain azo or azoxy compounds. The azo compounds have the formula:

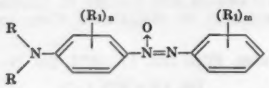


or

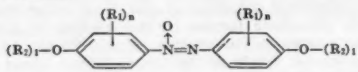


wherein the Rs are alkyl groups containing from 1 to 10 carbon atoms, n is a number from 0 to 4, m is a number from 0 to 5, R_1 is an alkyl group of from 1 to 5 carbon atoms, R_2 is an alkyl group of from 1 to 10 carbon atoms and R_3 is either an alkyl group of from 1 to 10 carbon atoms or a group of the formula

wherein R is an alkyl group of from 1 to 10 carbon atoms. The azoxy compounds have the formula:



where R, R_1, n and m have the meanings defined above, or the formula:



wherein R_1, R_2 and n have the meanings defined above.

3,832,305

HALOGENATED ALKYLENE GLYCOL ARYL ETHER STRIPPING COMPOSITION AND METHOD

Donald P. Murphy, Madison Heights, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.

No Drawing. Filed Jan. 17, 1973, Ser. No. 324,280

Int. Cl. C11d *7/06*

U.S. Cl. 252—158 **8 Claims**

Disclosed is a method and composition useful for stripping organic coatings. The stripping composition contains a ring halogenated alkylene glycol aryl ether of improved efficiency compared to the unhalogenated compound.

3,832,306

PROCESS FOR THE PREPARATION OF ACTIVE CARBON FROM HALOHYDROCARBONS

Homer L. Hackett, Lake Charles, La., and Charles M. Starks, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Filed Sept. 11, 1972, Ser. No. 287,955

Int. Cl. C01b *31/08*

U.S. Cl. 252—422 **1 Claim**

A process for producing active carbon and hydrogen halide by mixing a halohydrocarbon with a Lewis acid catalyst in an inert atmosphere and gradually increasing the temperature to initiate and maintain evolution of hydrogen halide, and recovering hydrogen halide and a carbon mass containing highly crystalline carbon.

3,832,307

HYDROGENATION CATALYST

Walter H. Seltzer, West Chester, Pa., assignor to Sun Research and Development Co., St. Davids, Pa.

No Drawing. Original application Apr. 29, 1971, Ser. No. 138,750, now Patent No. 3,723,298, dated Mar. 27, 1973. Divided and this application Nov. 13, 1972, Ser. No. 306,063

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 Z **2 Claims**

Hydrogenation of a mineral oil containing aromatic hydrocarbons by use of a hydrogenation catalyst comprised of a Y-zeolite containing arsenic.

3,832,308

ELECTRICALLY CONDUCTIVE COMPOSITION ELEMENT AND METHOD OF MAKING THE SAME

Curtis L. Holmes, Elkhart, Ind., and Lynn J. Brady, Edwardsburg, Mich., assignors to CTS Corporation, Elkhart, Ind.

Filed Aug. 2, 1968, Ser. No. 749,890

Int. Cl. C22b *11/00;* **H01b** *1/02*

U.S. Cl. 252—514 **4 Claims**

An electrically conductive composition mixed with a screening agent, is deposited on a substrate and fired at an elevated temperature to form a termination bonded to the substrate. The composition comprises a homogeneous mixture of approximately 70–95% by weight co-precipitated platinum-gold alloy particles, co-precipitated palladium-gold alloy particles or co-precipitated platinum-palladium-gold particles and approximately 5–30% by weight of glass frit.

3,832,309

DETERGENT FORMULATIONS

Walter E. Foster, and Paul Kobetz, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 111,721, Feb. 1, 1971. This application Aug. 7, 1972, Ser. No. 278,555

Int. Cl. C11d *3/26*

U.S. Cl. 252—527 **10 Claims**

To assist in obviating eutrophication of water, detergent builder systems based on the combination of citrates and nitrilotriacetates are used. Conventional detergent actives may be used with these builder systems.

3,832,310

DETERGENT COMPOSITIONS CONTAINING AMINOPOLYUREYLENE RESIN AND OPTICAL BRIGHTENERS

Paul Sheldon Grand, South Bound Brook, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

No Drawing. Original application Nov. 16, 1970, Ser. No. 90,154, now Patent No. 3,726,815. Divided and this application Nov. 22, 1972, Ser. No. 308,885

Int. Cl. C11d *1/48, 1/50, 3/26*

U.S. Cl. 252—543 **8 Claims**

Detergent compositions comprising a mixture of 2% to 99% by weight of a water-soluble organic detergent, 0.5% to 5% by weight of an aminopolyureylene resin having a molecular weight in the range of about 300 to 100,000 and 0.05% to 5% by weight of an active material which is an ultraviolet absorber or a fluorescent brightener.

3,832,311

FLAME-RESISTANT POLYURETHANE FOAMS

Erwin Windemuth, Leverkusen, Manfred Dahm, Bergisch-Neukirchen, Karl Hartwig Richert, Leverkusen, and Dieter Maassen, Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation of abandoned application Ser. No. 106,283, Jan. 13, 1971. This application June 6, 1972, Ser. No. 260,342

Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 AT **5 Claims**

Flame-resistant polyurethane foams are disclosed which are prepared by reacting a polyether polyol having a molecular weight of from about 750 to about 10,000 in which at least 10% of the hydroxyl groups are primary hydroxyl groups, with a polyisocyanate which is a solution of from about 10 to about 70% by weight of an organic polyisocyanate containing at least one N,N'-disubstituted allophanic acid ester group dissolved in a liquid polyisocyanate which is free from allophanic acid ester groups.

3,832,312

PROCESS FOR MAKING FOAMED STYRENE POLYMERS PHOTODEGRADABLE

Harold A. Wright, Murrysville, Pa., assignor to Arco Polymers, Inc.

No Drawing. Filed Mar. 12, 1973, Ser. No. 340,162

Int. Cl. C08c *17/10*

U.S. Cl. 260—2.5 HB **1 Claim**

Expandable styrene polymer particles which are photodegradable are produced by suspending styrene polymer particles in an aqueous medium and impregnating a blowing agent into the particles in the presence of 0.05–3.0 parts of benzophenone per 100 parts of polymer particles.

3,832,313

WATER SOLUBLE FILMS FROM HEMICELLULOSE

Marten Reintjes and Laurence Dean Starr, Shelton, Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

No Drawing. Filed Dec. 18, 1972, Ser. No. 316,065

Int. Cl. C08b *19/00, 25/00*

U.S. Cl. 260—9 **6 Claims**

Water soluble films are prepared from hardwood hemicelluloses by reacting the hemicelluloses in an alkaline medium with epichlorohydrin and an alkanolamine or glycerol. The reaction product upon purification, and neutralization, can be dried to form strong, flexible, non-hygroscopic, water soluble films. The hemicelluloses are extracted from hardwood or separated from pulp bleaching and refining effluents by known methods.

3,832,314

SEGMENTED COPOLYESTER ADHESIVE AND COATING COMPOSITIONS

George L. K. Hoh and Akira Tsukamoto, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

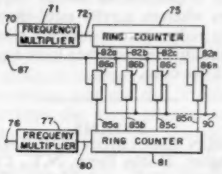
No Drawing. Continuation-in-part of application Ser. No. 151,477, June 9, 1971, which is a continuation-in-part of application Ser. No. 100,291, Dec. 21, 1970, both now abandoned. This application Aug. 10, 1972, Ser. No. 279,370

Claims priority, application Canada, Dec. 9, 1971, 129,800

Int. Cl. C08g *11/16, 39/00*

U.S. Cl. 260—26 **30 Claims**

Thermoplastic adhesive and coating compositions which comprise (A) about 1 to 99 percent by weight of thermoplastic segmented copolyester elastomer consisting essentially of a multiplicity of recurring short chain ester units and long chain ester units joined through ester linkages, said short chain ester units amounting to about 15 to 75 percent by weight of said copolyester and being derived from aromatic dicarboxylic acid such as terephthalic acid, or a mixture of terephthalic and isophthalic acids, and an organic diol such as butanediol and said long chain ester units amounting to about 25 to 85 percent by weight of said copolyester and being derived from aromatic dicarboxylic acid such as terephthalic acid, or a mixture of terephthalic and isophthalic acids, and



a long chain glycol such as polytetramethylene ether glycol, said copolyester having a melt index of less than about 150 and a melting point of at least about 125° C., and (B) about 1 to 99 percent by weight of one or more low molecular weight thermoplastic resins including hydrocarbon resins such as coumarone-indene resins, petroleum resins, styrene polymers, cyclopentadiene resins and terpene resins, bituminous asphalts, coal tar pitches, rosins, phenolic resins, chlorinated aliphatic hydrocarbon waxes, and chlorinated polynuclear aromatic hydrocarbons.

3,832,315

LIGHT SCATTERING POLYMERIC MASSES

Frederick J. Bueche, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed Feb. 1, 1971, Ser. No. 111,735

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 R **10 Claims**

Mixtures of a paraffin such as docosane in a polymer such as ethyl methacrylate are produced by admixing the paraffin in a monomer of the polymer and then polymerizing the monomer by conventional polymerization techniques. The result is an intimate mixture of microscopic domains of the paraffin in the polymer. The paraffin polymer mixtures have a wide variety of uses, e.g., they can be employed as the image portion (screen) of conventional display devices.

3,832,316

MELAMINE-DICYANDIAMIDE-BASE RESIN SOLUTIONS

Subhash C. Juneja, Ottawa, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

No Drawing. Filed June 1, 1972, Ser. No. 258,905

Int. Cl. C08g *51/24*

U.S. Cl. 260—29.4 R **5 Claims**

Resin solutions suitable particularly for fire-retardant and adhesive applications are prepared from melamine, dicyandiamide, formaldehyde and an oxy-acid of phosphorus. The melamine and dicyandiamide are dissolved in a heated alkaline formaldehyde solution, the solution cooled, and the oxy-acid of phosphorus slowly added, resulting in clear solutions of long pot-life. Fire-retardant and adhesive properties are evaluated.

3,832,317

PROCESS FOR REDUCING ACRYLIC ESTER MONOMER RESIDUES IN ACRYLATE LATICES

Bela K. Mikofalvy, 327 Erieview Blvd., Sheffield Lake, Ohio 44054, and Donald P. Knechtges, 1556 S. Durkee Road, Grafton, Ohio 44044

No Drawing. Original application Sept. 14, 1970, Ser. No. 72,106. Divided and this application Apr. 21, 1972, Ser. No. 246,388

Int. Cl. C08f *29/46*

U.S. Cl. 260—29.6 RB **4 Claims**

By including a small amount of a vinyl halide monomer in an acrylic ester emulsion polymerization which may additionally contain one or more other polymerizable comonomers it is possible to obtain improved acrylate polymer latices wherein acrylic ester monomer residues are significantly reduced or completely eliminated so that the latex and the isolated polymer have essentially no objectionable acrylate odor.

3,832,318

SUSPENSION EMULSION INTERPOLYMERS

Ruth E. Gallagher, Dobbs Ferry, N.Y., Charles L. Harrington, Newark, Del., and Melvin Wachtel, North Massapequa, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

No Drawing. Continuation of appplication Ser. No. 182,160, Sept. 20, 1971, which is a continuation-in-part of application Ser. No. 101,159, Dec. 23, 1970, both now abandoned. This application Mar. 22, 1973, Ser. No. 343,993

Int. Cl. C08d *9/10;* **C08f** *37/18, 29/24*

U.S. Cl. 260—29.7 UP **14 Claims**

Rubber-containing interpolymers are prepared by the suspension polymerization of vinyl chloride in the presence of an aqueous emulsion of particles comprising a crosslinked acrylic rubber having a Tg of less than about 25° C. The resulting interpolymer particles are particularly useful as high impact plastics and as modifiers for the reinforcement of relatively rigid types of plastics.

3,832,319

PROCESS AND COMPOSITION FOR STABILIZING SILICONE RESINS IN SOLUTIONS

Duane F. Merrill, Ballston Spa, N.Y., assignor to General Electric Company

No Drawing. Filed Aug. 10, 1972, Ser. No. 279,525

Int. Cl. C08g *51/36*

U.S. Cl. 260—31.2 R **18 Claims**

A process for stabilizing a solution of a silicone resin comprising adding to said solution 5 to 20% based on the weight of the resin solids of a stabilizing additive of the formula,

$$R^{10}OGOH$$

wherein in the above formula, R^{10} is selected from monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and G is selected from divalent hydrocarbon radicals. The most preferred stabilizing additive is butyl Cellosolve.

3,832,320

MODIFIED POLYBENZOTHIAZOLE-BASED ADHESIVE

Theodore J. Aponyi and Edward A. Arvay, Dayton, Ohio, assignors to the United States of America as represented by the Secretary of the United States Air Force

No Drawing. Filed Nov. 7, 1972, Ser. No. 304,585

Int. Cl. C08g *20/32, 33/02*

U.S. Cl. 260—32.6 NT **3 Claims**

An adhesive is provided that consists essentially of (1) a polybenzothiazole modified by reaction with 4-aminophthalimide, (2) aluminum and (3) zinc oxide. The adhesive is particularly useful in bonding structural members, e.g., those fabricated from stainless steel or titanium, that are subjected to high temperatures as in the operation of high performance aircraft.

3,832,321

PROCESS FOR THE PREPARATION OF A POLY (VINYL-ACETATE-DIALKYL MALEATE-ACRYLIC ACID) TEXTILE SIZE

Albert E. Corey, East Longmeadow, and Donald D. Donermeyer and Joel Fantl, Springfield, Mass., and Charles R. Williams, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 98,914, Dec. 16, 1970, now Patent No. 3,716,547, dated Feb. 13, 1973. This application Dec. 29, 1972, Ser. No. 319,246

The portion of the term of the patent subsequent to Feb. 12, 1990, has been disclaimed

Int. Cl. C08f *45/30*

U.S. Cl. 260—33.8 UA **16 Claims**

Disclosed herein is a process for the preparation of a poly(vinyl-acetate-dialkyl maleate-acrylic acid) textile size which comprises (1) inter-polymerizing the monomers at a temperature of from 40 to 60° C. to form a latex using a surfactant system comprising a phosphate ester of an alkyl phenol-ethylene oxide condensate wherein the alkyl group contains 7 to 11 carbon atoms; and (2) dissolving the resulting latex in a solvent to form the size.

3,832,322

AROMATIC FLUORO-POLYIMIDES

John Phillip Critchley, Farnham, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

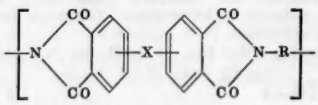
No Drawing. Filed Oct. 15, 1971, Ser. No. 189,793

Claims priority, application Great Britain, Oct. 21, 1970, 49,945/70; Aug. 19, 1971, 38,942/71

Int. Cl. C08g *51/04, 51/78*

U.S. Cl. 260—37 N **18 Claims**

Aromatic fluoropolyimide co-polymer compositions suitable for use as high temperature adhesives are provided which include the repeating unit:



wherein X is a divalent linking atom or group, advantageously, a direct link, —O—, —S—, —CO—, —SO_2—, —CH_2—, or —$(CF_2)_n$— where n is an integer from two to eight inclusive and R represents divalent aromatic groups having the formulae:

wherein Y is a divalent linking atom or group and is advantageously —O—, —S—, —CO—, —SO_2—, —CONH—, —CH_2—, or —$(CF_2)_n$— where n is as integer from two to eight inclusive and about 10 to 50 moles percent of said divalent aromatic groups have at least one direct nuclear substituent selected from organocarbonylamino groups, preferably acylamino groups, a carboxylic acid group, and alkoxy-carbonyl groups. Preferably there are present, a first direct nuclear substituent which is an organocarbonylamino group, preferably acylamino and a second direct nuclear substituent which is a carboxylic acid group or an alkoxycarbonyl group, the said first and second direct nuclear substituents being present in substantially equimolar proportions, and being attached to separate aromatic nuceli.

3,832,323

THIXOTROPIC B-COMPONENT FOR POLYURETHANE ELASTOMERS

Bobbie Joe Ramey and Philip Hotchkiss Moss, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Filed Mar. 12, 1973, Ser. No. 339,993

Int. Cl. C08g *22/20, 51/04*

U.S. Cl. 260—37 N 13 Claims

A thixotropic B-component for the production of polyurethane elastomers is disclosed whereby the B-component is comprised of an inert filler and a polyether polyol reactant wherein at least 1% by weight of the polyether polyol reactant is a polyether polyol wherein from about 5% to about 55% of the hydroxyl groups have been replaced with amino groups.

3,832,324

COMPOSITION FOR COATING SOLID SURFACES

Dean B. Parkinson, Redwood City, and Irvin A. Illing, Milpitas, Calif., assignors to McCall Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 810,100, Mar. 24, 1969, now Patent No. 3,554,392. This application July 6, 1972, Ser. No. 269,473

Int. Cl. C08g *45/08*

U.S. Cl. 260—38 15 Claims

A rapidly curable composition which contains no volatile solvent or diluent except one which reacts with the system and does not volatilize which includes a polymerizable cycloaliphatic polyepoxide, a phenol-aldehyde resin hardening agent and a polyvalent metal salt of a phenolic material or a polysiloxanol as a catalyst is useful as a glass coating composition and as a printing ink.

3,832,325

WEAR RESISTANT COMPOSITION BRAKE BLOCK

Franklin W. Eschen, Evergreen, Colo., assignor to Johns-Manville Corporation, Greenwood Village, Colo.

No Drawing. Filed Apr. 23, 1973, Ser. No. 353,830

Int. Cl. C08g *51/04*

U.S. Cl. 260—38 14 Claims

Compositions useful as railroad brake blocks are composed of SBR or nitrile rubber in combination with low (0.1–2%) zinc oxide, asbestos fiber, cast iron chips, a lead component, thermosetting resin, sulfur, and minor components. Such compositions show unexpectedly low and constant wear rates when compared to composition railroad brake blocks of the prior art.

3,832,326

FLAME RETARDANT COMPOSITIONS

Joyce A. North, Somerset, N.J., and Gerard W. Kuckro, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 153,120, June 14, 1972. This application June 1, 1972, Ser. No. 258,679

Int. Cl. C08f *45/04*

U.S. Cl. 260—42.29 5 Claims

Crosslinkable ethylene-vinyl acetate copolymer compositions containing silane-treated hydrated inorganic fillers illustrating improved moisture, heat resistance and flame retardance. An electrical conductor coated with such a copolymer composition is a particularly important application.

3,832,327

ALKALI METAL ALUMINO SILICATES, METHODS FOR THEIR PRODUCTION AND COMPOSITIONS THEREOF

Lowell E. Hackbarth, Bel Air, Md., and Joseph T. Crockett, Auburn, Ala., assignors to J. M. Huber Corporation, Borger, Tex.

No Drawing. Application Feb. 3, 1971, Ser. No. 112,469, now Patent No. 3,746,559, which is a continuation-in-part of application Ser. No. 730,892, May 21, 1968, now Patent No. 3,582,379. Divided and this application July 20, 1972, Ser. No. 273,674

Int. Cl. C08c *11/12*

U.S. Cl. 260—42.37 1 Claim

The subject matter of the following specification concerns the production of finely divided materials useful as pigments, moisture conditioners, paper fillers, and in rubber reinforcement and the like. Considering present economics, perhaps the most practical embodiment of the subject matter employs the reaction of a soluble sodium silicate and aluminum sulfate in producing precipitates commonly known and identifiable as sodium alumino silicates, the precipitate being ultimately collected as a dried particulate material of sub-micron particle size. The disclosed process involves conducting this general type of reaction in the presence of calculated quantity of sodium sulfate from the outset of the reaction whereby economics are improved and highly refined modifications in the characteristic of the final materials become obtainable. The reaction may be varied according to several conditions, such as pH, temperature, concentration, manner of feeding materials and the like whereby to better adapt the new materials to highly specialized needs, such as in rubber compounding and paper production.

3,832,328

ORGANIC COMPOSITIONS STABILIZED WITH PHENOLIC THIOCARBOXYLIC ACID ESTERS

Heinz Eggensperger, Gadernheim over Bensheim, Volker Frenzen, Heidelberg, Horst Muller, Furth-Odenwald, and Hans Stephan, Bensheim, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

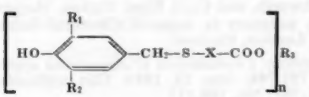
No Drawing. Continuation-in-part of abandoned application Ser. No. 883,314, Dec. 8, 1969, which is a division of application Ser. No. 661,213, Aug. 17, 1967, now Patent No. 3,637,802, dated Jan. 25, 1972. This application Aug. 9, 1971, Ser. No. 170,313

Claims priority, application Germany, Aug. 18, 1966, D 50,874

Int. Cl. C08c *27/66;* C08f *45/58;* C08g *51/58*

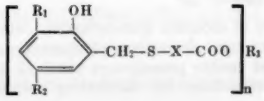
U.S. Cl. 260—45.85 B 13 Claims

Compounds of the formulae



(Ia)

and



(Ib)

are used as stabilizers for organic compositions.

In the formulae

n is an integer from 1 to 4

R_1 and R_2 are alkyl

R_3 for $n=1$, is a member of the group consisting of sulfur interrupted alkyl, oxygen interrupted alkyl, alkyl, phenyl, benzyl and phenyl having alkyl subsitutes; for $n=2$, alkylene; for $n=3$, alktriyl and for $n=4$, alktetrayl and

X is alkylene.

3,832,329

POLYESTERS PREPARED FROM HYDROXYARYLTHIO ANHYDRIDES

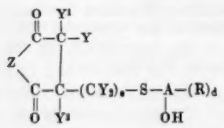
Emil J. Geering, Grand Island, and Norman W. Dachs, Buffalo, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Original application Aug. 5, 1968, Ser. No. 749,952, now abandoned. Divided and this application Feb. 16, 1971, Ser. No. 115,778

Int. Cl. C08g *17/08*

U.S. Cl. 260—47 C **7 Claims**

Novel compounds of the formula:



wherein e is from zero to one and d is from zero to about six, provided that when e is zero, Y^1 is hydrogen; and that when e is one, Y^2 is hydrogen; Y, Y^1 and Y^2 are of zero to about 20 carbon atoms and are independently selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, hydrogen, cyano, and halogen; Z is selected from the group consisting of —NH, —O—, —S— and —CH=CH—; A is aryl of six to 18 carbon atoms; and R is of zero to about 20 carbon atoms and is selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, carbalkoxy, carbaryloxy, alkoxy, aryloxy, alkylthio, arylthio, hydroxy, mercapto, cyano, carboxy and halogen. Said compounds have utility as polymer additives. Novel polyester derivatives of the hydroxyarylthio succinic anhydride and thioanhydride compounds and a process for preparing said polyesters.

3,832,330

POLYMERIZATION OF TETRACARBOXYLIC ACID DERIVATIVES AND UREA OR URETHANE DERIVATIVES OF DIAMINES

David Rodney Dixon, Dunstable, John Brewster Rose, Letchworth, and Cecil Nigel Turton, Harpenden, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation of abandoned application Ser. No. 751,768, Aug. 12, 1968. This application Oct. 18, 1971, Ser. No. 190,172

Claims priority, application Great Britain, Aug. 18, 1967, 38,220/67

Int. Cl. C08g *20/32*

U.S. Cl. 260—47 CP **8 Claims**

Mixtures of aromatic tetracarboxylic dianhydrides and urethane or urea derivatives of aromatic diamines and soluble and fusible prepolymers obtained therefrom are useful intermediates for fabricating polyimide articles.

3,832,331

POLYSULPHONES PREPARED FROM 3-(4-CHLOROPHENYLSULPHONYL)PHENOL AND METHOD OF PREPARATION

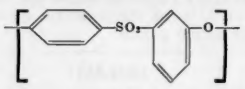
Alan Branford Newton, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation of abandoned application Ser. No. 803,961, Mar. 3, 1969. This application May 17, 1972, Ser. No. 254,036

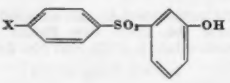
Int. Cl. C08g *23/00*

U.S. Cl. 260—49 **8 Claims**

New polymers and copolymers containing units of formula



may be made by nucleophilic poly-condensation of alkali metal salts of ahlo-phenols of formula



(where X is halogen) which are also new chemical compounds.

3,832,332

POLYAMIDE POLYMER OF DIAMINO METHYL ADAMANTANE AND DICARBOXYLIC ACID

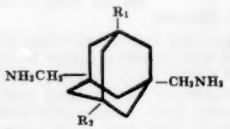
Robert M. Thompson, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Filed Oct. 22, 1971, Ser. No. 191,833

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 R **13 Claims**

A novel polyamide polymer is prepared by the condensation of an alkyladamantane diamine of the structure:



wherein each of R_1 and R_2 is an alkyl radical having 1–10 carbon atoms and a dicarboxylic acid having the following structure, $HOOC—(R)_n—COOH$ wherein R is one of the following: $—CH_2—$ with $n=2$–12 or a cyclic radical with $n=1$. The polymer is useful in forming films, transparent molded articles, sheets and fibers and other similar thermoplastic products.

3,832,333

LACTONE REACTION PRODUCTS

Wen-Hsuan Chang, Gibsonia, and Roger L. Scriven, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Oct. 16, 1973, Ser. No. 407,017

Int. Cl. C08g *22/00*

U.S. Cl. 260—77.5 C **11 Claims**

Novel lactone reaction products are obtained by reacting a lactone with urea or a polyureido compound. These

reaction products are useful in elastomeric coating formulations and in high-solids coating formulations.

3,832,334

CYANOACRYLATE ADHESIVE COMPOSITIONS HAVING IMPROVED THERMAL RESISTANCE

Denis J. O'Sullivan and David P. Melody, Dublin, Ireland, assignors to Loctite (Ireland) Limited, Dublin, Ireland

No Drawing. Filed Dec. 29, 1971, Ser. No. 213,839

Int. Cl. C08f *15/02*

U.S. Cl. 260—78.5 R **11 Claims**

Cyanoacrylate adhesive compositions containing maleic anhydride produce rapid bonds which possess increased thermal resistance.

3,832,335

BARRIER POLYMERS HAVING HIGH HEAT DISTORTION TEMPERATURES

John William Bayer, Toledo, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Filed May 1, 1972, Ser. No. 249,361

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.81 **19 Claims**

Polymer compositions prepared by the interpolymerization of an intimate mixture of acrylonitrile, vinylidene chloride and acrylate monomers which are useful in the fabrication of packaging materials. The interpolymers of this invention can be readily formed by solvent casting, compression molding, calendering, extrusion, and blow molding techniques into films or containers having outstanding oxygen barrier properties thereby affording excellent protection against oxygen degradation to oxygen sensitive materials packaged therein. Films and containers prepared from many of the preferred interpolymers of this invention also have surprisingly high heat distortion temperatures. This unique combination of properties makes these preferred polymeric materials ideally suited for the fabrication of hot-fill containers used in the packaging of oxygen sensitive foodstuffs, such as ketchup.

3,832,336

CURING AND POLYMERIZING PROCESSES EMPLOYING β-SUBSTITUTED DIPEROXYKETALS

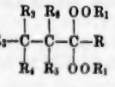
Jurgen Groepper, Gunburg, Germany, and Jose Sanchez, Grand Island, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

No Drawing. Original application June 3, 1970, Ser. No. 43,208, now Patent No. 3,686,102. Divided and this application Feb. 18, 1972, Ser. No. 227,600

Int. Cl. C08f *3/56, 7/04*

U.S. Cl. 260—89.1 **4 Claims**

Improvements in the polymerization of ethylenically unsaturated monomers, the curing of unsaturated polyester resin compositions, and the curing (preferably curing and foaming) of elastomer compositions are achieved by the use of certain β-substituted diperoxyketals of the formula



such as 2,2 - di(t - butylperoxy) - 4 - methylpentane and 4,4-di(t-butylperoxy)heptane.

3,832,337

PEPTIDE ENZYME INHIBITORS

Miguel A. Ondetti, North Brunswick, and Josip Pluscec, East Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Continuation-in-part of applications Ser. No. 58,686, July 28, 1970 and Ser. No. 61,794, Aug. 6, 1970, which is a continuation-in-part of application Ser. No. 20,860, Mar. 18, 1970, all now abandoned. This application June 1, 1972, Ser. No. 258,714

Int. Cl. A61k *27/00;* **C07c** *103/52*

U.S. Cl. 260—112.5 **13 Claims**

The enzymatic conversion of angiostensin I into angiotensin II is inhibited by a peptide or an acylated peptide having one of the following amino acid sequences:

1. An acylated tripeptide of the formula

Cac-Phe-Ala-Pro

wherein Cac is chloroacetic acid;

2. A tetrapeptide of the formula

pGlu-Trp-Ala-Pro or pGlu-Lys-Trp-Ala;

3. An acylated tetrapeptide of the formula

Dac-Fly-Phe-Ala-Pro or A-Lys-Phe-Ala-Pro

wherein Dac is diazoacetic acid, and A is chloroacetic acid, cyclobutylcarboxylic acid, cyclopentylcarboxylic acid or cyclohexylcarboxylic acid;

4. A pentapeptide of the formula

pGlu-B-Phe-Ala-Pro

wherein B is Lys, Nle, Glu or Gln;

pGlu-C-Trp-Ala-Pro

wherein C is Nle, His, Orn or Arg;

N'pGlu-Lys-Trp-Ala-Pro; pGlu-Lys-E-Ala-Pro

wherein E is His, Ile, Pro, Ser or 3-amino-4-phenyl-butyric acid;

pGlu-Lys-Phe-F-Pro

wherein F is Gly, Pro or Lac;

pGlu-Lys-Phe-Ala-G

wherein G is Ala, Asp or Glu;

pGlu-Lys-Trp-H

wherein H is Ile-Pro, Thr-Pro, Ala-Gly or Ala-Sar;

pGlu-Trp-Pro-J-Pro

wherein J is His, Lys or Gly;

5. An acylated pentapeptide of the formula

Dac-Gly-Gly-Phe-Ala-Pro

wherein Dac is diazoacetic acid;

6. A hexapeptide of the formula

pGlu-Lys-Phe-Ala-Pro-Pro; pGlu-K-Trp-Pro-Arg-Pro

wherein K is Asn, Nle or Ser;

pGlu-Nle-Trp-Pro-L-Pro

wherein L is His or Gly;

pGlu-Asn-Trp-Pro-M-Pro

wherein M is Lys or Gly;

7. An octapeptide of the formula

pGlu-Ile-Pro-Pro-Lys-Phe-Ala-Pro;

8. An acylated octapeptide of the formula

N-O-Pro-Arg-Pro-Gln-Ile-Pro-Pro

wherein N is cyclobutylcarboxylic acid, cyclopentylcarboxylic acid or cyclohexylcarboxylic acid and O is Trp, Tyr,

Bzl
|
Tyr,

Phe, Gly, Leu, or D-Trp;

N-Trp-Pro-Gly-Pro-Lys-βHphe-Ala-Pro

wherein N is as defined above and βHphe is 3-amino-4-phenylbutyric acid;

9. A nonapeptide of the formula

pGlu-Trp-Pro-P-Pro-Q-Ile-Pro-Pro

wherein P is Arg, His, Lys or Gly and Q is Gln or Asn;

pGlu-Trp-Pro-R-Pro-S-T-Ala-Pro

wherein R is Arg or Orn, S is Nle or Gln and T is Ile or Phe;

pGlu-Trp-Pro-Orn-Pro-S-T-Pro-Pro

wherein S and T are as defined above;

pGlu-O-Pro-Arg-Pro-Gln-Ile-Pro-Pro

wherein O is as defined above;

pGlu-Trp-Pro-Arg-Pro-Nle-T-Pro-Pro

wherein T is as defined above;

pGlu-Trp-Pro-Arg-Pro-Glu-Phe-Pro-Pro;
pGlu-Trp-Pro-Arg-Pro-Lys-Phe-Ala-Pro;
pGlu-Trp-Pro-D-Arg-Pro-Gln-Ile-Pro-Pro;
pGlu-Trp-Pro-Arg-Pro-Gln-Phe-Pro-Pro;
pGlu-Trp-Pro-Gly-Pro-Glu-Ile-Pro-Pro;
pGlu-Lys-Phe-Ala-Pro-Gln-Ile-Pro-Pro;

10. A decapeptide of the formula

pGlu-K-Trp-Pro-P-Pro-Q-Ile-Pro-Pro

wherein K, P and Q are as defined above;

pGlu-U-Trp-Pro-Arg-Pro-Gln-Ile-Pro-Pro

wherein U is Lys or Glu;

11. An undecapeptide of the formula

pGlu-Trp-Pro-Arg-Pro-V-Pro-W-Ile-Pro-Pro

wherein V is Thr or Gly and W is Gln or Glu;

12. A tridecapeptide of the formula

pGlu-Gly-Gly-Trp-Pro-Arg-Pro-Gly-Pro-W-Ile-Pro-Pro

wherein W is as defined above.

3,832,338

ORGOTEIN PRODUCTION USING A BUFFER SOLUTION CONTAINING DIVALENT METAL SALTS

Wolfgang Huber, San Francisco, and Thomas L. Schulte, Woodside, Calif., assignors to Diagnostic Data, Inc., Mountain View, Calif.

No Drawing. Continuation-in-part of application Ser. No. 237,507, Mar. 23, 1972, now Patent No. 3,758,682, which is a continuation-in-part of application Ser. No. 15,883, Mar. 2, 1970, which is a continuation-in-part of application Ser. No. 3,538, Jan. 16, 1970, which is a continuation-in-part of application Ser. No. 576,454, Aug. 31, 1966, which in turn is a continuation-in-part of application Ser. No. 494,048, Oct. 8, 1965, all now abandoned. This application Feb. 7, 1973, Ser. No. 330,401

The portion of the term of the patent subsequent to May 18, 1988, has been disclaimed

Int. Cl. A61k *17/00;* **C07g** *7/04*

U.S. Cl. 260—113 **10 Claims**

The isolation of orgotein from an aqueous solution of a mixture of proteins comprising it is facilitated by conducting the isolation in an aqueous solution containing a divalent metal having an ionic strength of 0.60 to 1.00 A., preferably copper, zinc or both.

3,832,339

POLYAZO PIGMENTS OF THE 2 - HYDROXY-NAPHTHALENE-3-CARBOXYLIC ACIDARYLIDE SERIES

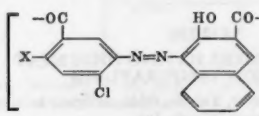
Emil Stocker, deceased, by Heidi Berta Stocker-Boller, representative, Riehen, Ernfred Schnabel, Reinach, and Georg Anton Klein, Bottmingen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed June 22, 1971, Ser. No. 155,612

Int. Cl. C09b *43/12;* **D06p** *1/52, 3/54*

U.S. Cl. 260—144 **2 Claims**

Polyazo pigments of the formula



wherein R is an arylene group, the bonds to which are not in the ortho-position, X is hydrogen or chlorine atom and *n* is a whole number greater than 3, are useful for coloring plastics and lacquers, especially soft polyvinyl chloride in red shades with good light and sublimation fastness properties.

3,832,340

SALTS OF NITROGEN BASES AND POLYSACCHARIDE SULFATES

Pierre Charles Wirth, Paris, France, assignor to Societe Generale de Recherche et d'Applications Scientifiques Sogeras, Paris, France

No Drawing. Filed Apr. 9, 1971, Ser. No. 132,831

Int. Cl. C07c *69/32, 129/18*

U.S. Cl. 260—210 E **6 Claims**

Salts formed between pharmaceutically active nitrogenous organic bases such as noscapine or papaverine and various polysaccharide sulphates such as arabogalactan sulphates or agarose sulphate. These salts have a longer duration of therapeutic activity than the bases themselves.

3,832,341

PURINE NUCLEOSIDE NITRATES

Robert Duschinsky, Pully, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed May 4, 1972, Ser. No. 250,218

Claims priority, application Switzerland, Sept. 10, 1971, 13,298/71

Int. Cl. C07d *51/54*

U.S. Cl. 260—211.5 R **14 Claims**

Purine nucleoside nitrate derivatives and a process for the manufacture thereof are described. The purine nucleoside nitrates are cardiac agents.

3,832,342

INHIBITED STARCH PRODUCTS CONTAINING LABILE AND NON-LABILE CROSS-LINKS

Morton W. Rutenberg, North Plainfield, Martin M. Tessler, Edison, and Leo Kruger, Kendall Park, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Filed Sept. 11, 1972, Ser. No. 287,887

Int. Cl. C08b *19/04*

U.S. Cl. 260—233.5 **9 Claims**

Granular starch is inhibited with two different cross-linking agents, one producing a labile cross-linkage and the other a non-labile cross-linkage. The thus produced starch derivatives display utility in food products.

3,832,343
PROCESS FOR OBTAINING AN EXTRACT OF *ARNICA MONTANA*
Bernard Majole, Dijon, France, assignor to Societe de Recherches Industrielles S.O.R.I., Paris, France
No Drawing. Filed Sept. 21, 1972, Ser. No. 290,826
Claims priority, application France, Sept. 22, 1971, 7134172
Int. Cl. C07g *17/00*
U.S. Cl. 260—236.5 11 Claims

The invention provides a process for extracting *Arnica montana*, in which the plant is extracted with at least one solvent chosen from petroleum ether, diethyl ether, acetone, chloroform, ethanol, water and their mixtures, the resulting filtrate or filtrates are treated with methanol, and polar substances are removed by filtration after treatment of the solution obtained with ethyl acetate. The extract so obtained has activity in preventing the coagulation of blood.

3,832,344
PROCESS FOR PRODUCING 1-SUBSTITUTED BENZODIAZEPINE DERIVATIVES
Tadashi Okamoto, Ashiya, Takeshi Akase, Nishinomiya, Takahiro Izumi, Takarazuka, Mitsuhiro Akatsu, Ikeda, Yoshiharu Kume and Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Nishinomiya, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
No Drawing. Filed Oct. 15, 1971, Ser. No. 189,754
Claims priority, application Japan, Oct. 17, 1970, 45/91,354; Nov. 7, 1970, 45/98,046, 45/98,048; Dec. 25, 1970, 45/129,009
Int. Cl. C07d *53/06*
U.S. Cl. 260—239 BD 4 Claims

1-Alkyl-substituted-1,4-benzodiazepine or 1,4-benzodiazepin-2-one derivative is prepared by alkylating corresponding 1-unsubstituted-derivative with corresponding alkyl halide or dialkyl sulfate in the presence of a hydrocarbonlithium compound. According to the process, there are prepared such valuable compounds as central nervous-controlling agents as 1-cyclopropylmethyl-5-phenyl-7-chloro - 2,3-dihydro-1H-1,4-benzodiazepine, 1-methyl-5-phenyl - 7 - chloro-2,3-dihydro-1H-1,4-benzodiazepine, 1-methyl-5-phenyl-7-chloro-1,3-dihydro - 2H - 1,4-benzodiazepin-2 - one and 1 - cyclopropylmethyl - 5 - (o-fluorophenyl)-7-chloro-1,3-dihydro - 2H - 1,4-benzodiazepin-2-one.

3,832,345
17-DESOXY STEROIDAL PYRAZOLES AND PROCESSES OF PREPARING THEM
Ralph F. Hirschmann, Scotch Plains, N.J., and John Fried, Palo Alto, Calif., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Continuation-in-part of application Ser. No. 505,986, Nov. 1, 1965, which is a continuation-in-part of application Ser. No. 476,160, July 30, 1965, both now abandoned. This application June 5, 1970, Ser. No. 43,961
Int. Cl. C07c *173/10*
U.S. Cl. 260—239.5 2 Claims

The invention disclosed herein is concerned generally with novel [3,2-c] pyrazole compounds of the pregnane series, and with the process of preparing the same. More particularly, it relates to 4-pregneno-, 5α-pregnano-, and 4,6-pregnadieno- [3,2-c] pyrazoles which are unsubstituted at the 17α-position, and to processes of making these 17-desoxy-steroidal pyrazoles of the pregnane series by reacting the corresponding 17α-hydroxy 21-alkanoyloxy-steroidal pyrazole with a lower alkanolic solution of a mineral acid to form the corresponding 17-desoxy-21,21-dialkoxy analog, and reacting the latter with a reducing agent followed by a hydrolyzing agent to produce the corresponding 17-desoxy-20-hydroxy-21-aldehydo derivative, and reacting the latter compound with an alkali metal bisulfite followed by an alkali metal alkoxide to produce the corresponding 17-desoxy-20-keto-21-hydroxy-steroidal pyrazole.

3,832,346
2'-(4 PYRIDYL) - 6,16α - DIMETHYL - 20-OXO-11β,17α,21 - TRIHYDROXY-PREGNA - 4,6-DIENO (3,2-c) PYRAZOLE AND INTERMEDIATES IN THE PRODUCTION THEREOF
John Hannah, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.
No Drawing. Continuation-in-part of application Ser. No. 167,802, July 30, 1971. This application Sept. 11, 1973, Ser. No. 396,287
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.5 4 Claims

The invention disclosed herein relates to the novel compound 2' - (4-pyridyl)-6,16α-dimethyl-20-oxo-11β, 17α,21 - trihydroxy-pregna-4,6-dieno[3,2-c]pyrazole and its pharmacologically acceptable salts, characterized as having high anti-inflammatory activity on topical administration with relatively low systemic action, and to pharmaceutical compositions thereof adapted for topical use. This new topical anti-inflammatory steroid is prepared by reacting 4-hydrazino-pyridine with 2-hydroxy-methylene - 6,16α - dimethyl - 11β - hydroxy-17,20:20,21-bis (methylenedioxy)-pregna-4,6-diene-3-one, thereby forming 2'-(4-pyridyl)-6,16α-dimethyl-11β-hydroxy-17,20:20, 21-bis(methylenedioxy)-pregna - 4,6 - dieno[3,2-c]pyrazole, and reacting the latter compound with an acidic hydrolyzing agent.

3,832,347
IMINO-HALIDES OF 3-AMIDO - 2 - HALO-1-(1'-PROTECTED CARBOXY - 2'-METHYL-1'-PROPENYL)-4-AZETIDINONES
Stjepan Kukolja, Indianapolis, and Steven R. Lammert, Greenwood, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
No Drawing. Filed Sept. 21, 1971, Ser. No. 182,556
Int. Cl. C07d *25/02, 99/10*
U.S. Cl. 260—239 A 4 Claims

Imino-halides of 3-amido-2-halo-1-(1'-protected carboxy-2'-methyl-1'-propenyl)-4-azetidinones, and a process for preparing bicyclic thiazoline azetidinones by reacting the above imino-halides with hydrogen sulfide or a thioalkanoate ion in the presence of a base in an aprotic solvent. The thiazoline azetidinone compounds are useful in processes for making amido-thiazole compounds which are useful as antibacterial and antifungal agents.

3,832,348
N-(THIO)-GLUTARIMIDES AND N-(THIO)-ADIPIMIDES
Aubert Yaucher Coran and Joseph Edward Kerwood, Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Division of application Ser. No. 29,717, Mar. 27, 1970, a division of application Ser. No. 714,-445, Mar. 20, 1968, now Patent No. 3,546,185, dated Dec. 8, 1970, which is a continuation-in-part of application Ser. No. 579,493, Sept. 15, 1966, a continuation-in-part of application Ser. No. 549,730, May 12, 1966, and a continuation-in-part of application Ser. No. 459,-466, May 27, 1965, all now abandoned. Divided and this application Nov. 13, 1972, Ser. No. 306,021
Int. Cl. C07d *29/20, 41/02*
U.S. Cl. 260—239.3 R 10 Claims

Sulfenamides characterized by carbonyl adjacent to the sulfenamide nitrogen of the formula R—S—A in which A is glutarimidyl, dialkylglutarimidyl, and adipimidyl and R is alkyl, aryl or cycloalkyl are inhibitors of premature vulcanization of vulcanizable elastomers.

3,832,349

SUBSTITUTED NAPHTHO[2,1-b]PYRYLIUM PERCHLORATES

Shoji Maruyama, Tomio Kubota, Katue Kojima, and Masahide Harada, Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

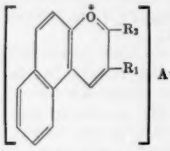
Filed Dec. 23, 1971, Ser. No. 211,418

Claims priority, application Japan, Dec. 29, 1970, 45/130,212, 45/130,218

Int. Cl. C07d *7/24*

U.S. Cl. 260—240 D **4 Claims**

Naphthopyrylium salts represented by the formula (I):



wherein R_1 is selected from the group consisting of, p-alkylstyryl in which the alkyl has 1 – 3 carbon atoms, p-alkoxystyryl in which the alkyl has 1 – 2 carbon atoms, 3,4-dialkoxystyryl in which the alkyl has 1 – 2 carbon atoms, 3,4,5-trialkoxystyryl in which the alkyl has 1–2 carbon atoms, p-dialkylaminostyryl in which the alkyl has 1–4 carbon atoms, p-nitrostyryl, p-halogenostyryl, p-carboxystyryl; R_2 is selected from the group consisting of, p-alkoxyphenyl in which the alkyl has 1 – 2 carbon atoms, styryl, p-alkylstyryl in which the alkyl has 1 – 3 carbon atoms, p-alkoxystyryl in which the alkyl has 1 – 2 carbon atoms, 3,4-dialkoxystyryl in which the alkyl has 1 – 2 carbon atoms, 3,4,5-trialkoxystyryl in which the alkyl has 1–2 carbon atoms, p - aminostyryl, p - dialkylaminostyryl in which the alkyl has 1 – 4 carbon atoms, p-nitrostyryl, p - halogenostyryl, 2 - (α - pyrrolyl)ethenyl, 2-(α-thienyl) ethenyl, 2-(β-indolyl)ethenyl, 2-(α-furyl)ethenyl and 2-(4′-alkoxynaphthyl)ethenyl in which the alkyl has 1–2 carbon atoms and 2-(1-naphthyl)ethenyl, and A^- is an anion functional group, and their use as a sensitizer for organic photoconductors.

3,832,350

METHOD FOR THE MANUFACTURE OF A DECOLORIZED DERIVATIVE OF BENZOPYRYLIUM SALT

Shoji Maruyama, Tomio Kubota, Katue Kojima, and Hiroshi Tamura, Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

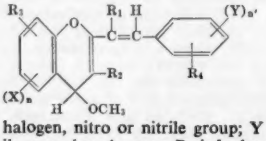
Filed Dec. 23, 1971, Ser. No. 211,419

Claims priority, application Japan, Dec. 26, 1970, 45/129,623

Int. Cl. C07d *7/32*

U.S. Cl. 260—240 D **3 Claims**

A method for the preparation of a decolorized derivative having the formula (I)



where X is halogen, nitro or nitrile group; Y is halogen, nitro, nitrile or carboxyl group; R_1 is hydrogen or alkyl group having 1–4 carbon atoms; R_2 is hydrogen or phenyl group R_3 and R_4 are hydrogen, alkyl group having 1–2 carbon atoms, or methoxyl group; n and n' ar 0, 1 or 2, but at least one of n and n' is not zero, wherein a benzopyrylium salt is heated in a mixed solvent of methanol-benzene containing alkali, and the solution is then concentrated and poured into a mixture of crushed ice water.

3,832,351

AROMATIC IMIDOCARBONATES

Shizuya Tanaka, Minoo, Toshiaki Ozaki and Akihiko Mine, Toyonaka, Katsutoshi Tanaka, Takarazuka, Sigeo Yamamoto, Toyonaka, Tadashi Ooishi, Takarazuka, Naganori Hino, Toyonaka, and Takeo Satomi, Takarazuka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

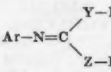
No Drawing. Continuation-in-part of abandoned application Ser. No. 133,744, Apr. 13, 1971. This application Mar. 27, 1972, Ser. No. 238,537

Claims priority, application Japan, Apr. 21, 1970, 45/34,457; Nov. 22, 1971, 46/93,874

Int. Cl. C07d *31/50*

U.S. Cl. 260—294.8 E **7 Claims**

Novel imidocarbonate derivatives having the formula:



wherein Y and Z, which may be the same or different, are individually an oxygen or sulfur atom; Ar is an unsubstituted or a halogen- or lower C_1–C_4 alkyl (straight or branched)-substituted benzene or pyridine nucleus, the number of the substituents being 1 to 3; R^2 is a C_1–C_{18} alkyl (straight or branched), C_1–C_{18} alkyl (straight or branched) having 1 to 3 hydroxy radicals or 1 to 3 alkoxycarbonyl (the alkoxy has 1 to 4 carbon atoms) radicals in the carbon chain, a C_3–C_{10} cycloalkyl, a C_2–C_5 alkenyl alkyl (straight or branched), C_1–C_{18} alkyl (straight or branched), a phenylalkyl, the benzene nucleus of which may be unsubstituted or submitted by 1 to 4 halogen atoms, 1 to 4 lower C_1–C_4 alkyl (straight or branched) radicals or a nitro radical, or a halogen- or lower C_1–C_4 alkyl (straight or branched-substituted phenoxyalkyl; R^3 is a C_1–C_{18} alkyl (straight or branched) having 1 to 3 hydroxy radicals or 1 to 3 alkoxycarbonyl (the alkoxy has 1 to 4 carbon atoms) radicals in the carbon chain, a C_2–C_5 alkenyl (straight or branched), a C_3–C_6 alkynyl (straight or branched) or a phenylalkyl, the benzene nucleus of which may be unsubstituted or substituted by 1 to 4 halogen atoms, 1 to 4 lower C_1–C_4 alkyl (straight or branched) radicals, a nitro radical or a C_2–C_4 alkylene radical, provided that in case Ar is an unsubstituted or substituted benzene nucleus and R^2 and R^3 are phenylalkyl groups, the benzene nucleus of at least one of said phenylalkyl groups has a substituent, have strong microbicidal activities on a wide scope of microorganisms.

3,832,352

2-(THI)OXO-3-IMIDAZOLYL(2)-TETRAHYDROIMIDAZOLES

Atso Ilvespää, Neuallschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

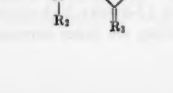
No Drawing. Filed May 2, 1972, Ser. No. 249,598

Claims priority, application Switzerland, May 3, 1971, 6,467/71; Nov. 3, 1971, 15,983/71; Feb. 8, 1972, 1,808/72

Int. Cl. C07d *49/36*

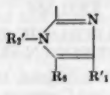
U.S. Cl. 260—309.7 **10 Claims**

The present invention relates to nitro-imidazoles of the formula I



(I)

wherein R_1 is hydrogen or lower alkyl, R_2 is lower alkyl or hydroxy-lower alkyl, R_3 is oxo or thioxo, R_4 is hydrogen, lower alkyl, lower alkanoyl or the group



wherein R_1' and R_2' are the same as R_1 and R_2 and R_6 is nitro, and alk is 1,2-ethylene, 1,2-propylene, 2,3-butylene or 2-methyl-1,2-propylene group, or a physiologically tolerable salt thereof, which are suitable for treating Gram-negative bacteria, protozoa and worms.

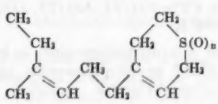
3,832,353

2H-THIAPYRANS

Daniel Hainaut, Villemomble, Edmond Toromanoff, Paris, and Jean-Pierre Demoute, Montreuil-sous-Bois, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed July 25, 1972, Ser. No. 275,107
Claims priority, application France, July 27, 1971, 7127448
Int. Cl. C07d *65/08*
U.S. Cl. 260—327 TH **2 Claims**

Novel 2H-thiapyrans of the formula:



I

wherein n is 0 or 1 and especially the Z isomers which have remarkable insecticidal properties and are intermediates in the synthesis of juvenile hormone and their preparation.

3,832,354

4-HYDROXY-5-PHENYL-3-THIOPHENE ACETIC ACIDS AND THEIR DERIVATIVES

Fulvio Gadient and Andre Stoll, Birsfelden, and Rudolf Suess, Bettingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

No Drawing. Continuation-in-part of abandoned application Ser. No. 277,126, Aug. 1, 1972. This application Feb. 22, 1973, Ser. No. 334,671
Int. Cl. A61k *27/00;* **C07d** *63/16*
U.S. Cl. 260—332.2 A **29 Claims**

The invention concerns substituted or non-substituted 4-hydroxy-5-phenyl-3-thiophene acetic acids which are useful as antiphlogistics and anti-arthritis agents.

3,832,355

CATALYTIC OXIDATION PROCESS

Gerald Myer Jaffe and Edward John Pleven, Verona, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation-in-part of abandoned application Ser. No. 37,020, May 13, 1970. This application Mar. 28, 1972, Ser. No. 238,940
Int. Cl. C07d *15/04*
U.S. Cl. 260—340.7 **13 Claims**

In the catalytic oxidation of a ketal of a sugar alcohol to a ketal of an aldonic acid in an aqueous alkaline medium with oxygen or an oxygen containing gas, utilizing a noble metal catalyst, the catalyst life is extended and the yields are increased by controlling the amount of oxygen passed through the reaction medium during the entire reaction to eliminate the presence of excess oxygen in the reaction medium and to maintain the percent of oxygen consumed from the inlet gas at a value during the reaction at least as great as that value at the start of the reaction when the presence of excess oxygen in the reaction medium was substantially eliminated.

3,832,356

ACETAL DIMERS OF CYCLIC ACETALS

Glenn M. Nakaguchi and Ting-I Wang, Fullerton, and Frederick F. Caserio, Jr., Laguna Beach, Calif., assignors to Atlantic Richfield Company, Philadelphia, Pa.

No Drawing. Original application July 15, 1969, Ser. No. 841,983, now Patent No. 3,714,202, dated Jan. 30, 1973. Divided and this application Oct. 24, 1972, Ser. No. 300,046
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 **1 Claim**

The acetal dimer of the cyclic acetal of a triol is a useful intermediate in the catalytic synthesis of two classes of vinyl cyclic acetal compounds, 2-methyl-5-vinyloxy-1,3-dioxane and 2-methyl-4-vinyloxymethyl-1,3-dioxolane.

3,832,357

PROCESS FOR PREPARATION OF 3-HYDROXY-2-ALKYL-4-PYRONE

Masaru Higuchi and Tadashi Yamada, Ohimachi, and Ryoshu Suzuki, Kawagoe, Japan, assignors to Daicel Ltd., Osaka, Japan

No Drawing. Filed May 24, 1972, Ser. No. 256,538
Claims priority, application Japan, May 26, 1971, 46/35,982; Dec. 22, 1971, 46/104,332
Int. Cl. C07d *7/16*
U.S. Cl. 260—345.9 **12 Claims**

A process for the preparation of 3-hydroxy-2-alkyl-4-pyrone in which the alkyl is methyl or ethyl, which comprises reacting a β,δ-dioxoaldehyde dialkylacetal in which the aldehyde is selected from caproaldehyde and enanthaldehyde, with an aryl iodosodicarboxylate to form an oxidatively acyloxylated product, subjecting the acyloxylated product to thermal decomposition or treatment with an acidic condensing agent, and hydrolyzing the same successively or concurrently with said thermal decomposition or treatment with an acidic condensing agent.

3,832,358

DESHYDROXYMETHYL DERIVATIVES OF MONENSIN

James W. Chamberlin, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Jan. 15, 1973, Ser. No. 323,600
Int. Cl. C07d *7/46*
U.S. Cl. 260—345.7 **2 Claims**

Deshydroxymethyl derivatives of monensin and nigericin are disclosed. The new compounds are useful as coccidiocides.

3,832,359

PRODUCTION OF MALEIC ANHYDRIDE BY CATALYTIC OXIDATION OF SATURATED ALIPHATIC HYDROCARBONS

Marshall C. Freerks and Michael Suda, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Oct. 6, 1971, Ser. No. 187,114
Int. Cl. C07d *5/04*
U.S. Cl. 260—346.8 **6 Claims**

Maleic anhydride is produced by the catalytic vapor phase oxidation of a saturated aliphatic hydrocarbon, e.g., n-butane, in the presence of a catalyst comprising phosphorus, vanadium, iron and oxygen.

3,832,360

PROCESS FOR THE CONTINUOUS PREPARATION OF TRIMELLITIC ACID ANHYDRIDE

Albert Hirz, Kurt Handrick, and Georg Kölling, Essen, Germany, assignors to Bergwerksverband GmbH, Essen-Kray, Germany

Filed June 18, 1970, Ser. No. 47,459
Claims priority, application Germany, June 19, 1969, P 19 30 934.3
Int. Cl. C07c *63/32*
U.S. Cl. 260—346.3 **3 Claims**

A process for the continuous preparation of trimellitic acid anhydride by thermal dehydration of the acid at

temperature in the range of about 210–260° C., which comprises passing trimellitic acid through an inclined rotating kiln having a plurality of compartments formed by vertical partitions, all compartments with the exception of the one at the discharge end being filled to about one-fifth to one-thirtieth of their volume by a plurality of balls. The invention also relates to an apparatus for carrying out the process.

3,832,361

AZIDES

Clive A. Henrick and John B. Siddall, Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

No Drawing. Original application Feb. 16, 1971, Ser. No. 115,725. Divided and this application Aug. 18, 1972, Ser. No. 281,898

Int. Cl. C07d *109/00*

U.S. Cl. 260—349 **4 Claims**

Polyunsaturated aliphatic hydrocarbon thiolesters, nitriles, amines, halides, alcohols and derivatives thereof, synthesis thereof, for the control of arthropods.

3,832,362

EPOXIDIZED ALKYLIDENE AND ARYLIDENE INDANDIONES

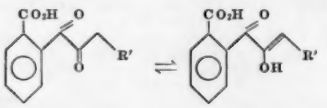
Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed May 18, 1972, Ser. No. 254,601

Int. Cl. C07d *1/00*

U.S. Cl. 260—348 R **2 Claims**

Method for the preparation of compounds of the formula



wherein R' is lower alkyl or aryl,

useful as intermediates for fluorometric reagents, comprising condensation of 1,3-indandione with a lower alkyl or aryl aldehyde, epoxidation and basic cleavage.

3,832,363

METHOD OF EPOXIDIZING OLEFINIC COMPOUNDS USING AN OXYBORON CATALYST

Lloyd C. Fetterly and George W. Conklin, Oakland, and Nathan C. May, Berkeley, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Sept. 7, 1965, Ser. No. 485,563

Int. Cl. C07d *1/08*

U.S. Cl. 260—348.5 V **6 Claims**

Ethylenic compounds are epoxidized to corresponding oxirane compounds by reaction with an organic hydroperoxide, especially one containing only C, H, and O atoms, e.g., tertiary butyl hydroperoxide, in the presence of a boron oxide, a dehydrated boric acid and the hydrocarbyl esters thereof, especially a trialkoxyboroxine. Boron oxide or dehydrated boric acid in the reaction mixture reacts with alcohols formed in the process to provide alkyl borate esters in the reaction mixture. The hydroperoxide can be provided by an in situ reaction of molecular oxygen with saturated aliphatic, acyclic and alicyclic, including aryl-substituted aliphatic compounds, such as a paraffin hydrocarbon, which react with oxygen to form a hydroperoxide in the presence of the ethylenic compound.

3,832,364

AMINATION OF AROMATIC COMPOUNDS IN LIQUID HYDROGEN FLUORIDE

Dale Robert Coulson, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 25, 1972, Ser. No. 256,770

Int. Cl. C07c *87/50, 97/12*

U.S. Cl. 260—378 **26 Claims**

Disclosed herein is a process for making aromatic amines from benzene or substituted benzene and an aminating agent via direct amination in liquid hydrogen fluoride medium as solvent and catalyst.

3,832,365

QUINONE INTERMEDIATES FOR SYNTHESIS OF 6-HYDROXYDOPAMINE

Pius Anton Wehrli, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Mar. 14, 1972, Ser. No. 234,658

Int. Cl. C07c *103/12, 103/22, 125/06*

U.S. Cl. 260—396 R **4 Claims**

Preparation of 6-hydroxydopamine, a known antihypertensive and blood pressure lowering agent, from an hydroxy-alkoxy-phenethylamine including intermediates in this process.

3,832,366

PROCESS FOR PREPARING 21-CHLORO-17-ACYLOXY-20-KETOSTEROIDS

Christopher M. Cimarusti, Hamilton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Filed July 30, 1973, Ser. No. 384,158

Int. Cl. C07c *169/34*

U.S. Cl. 260—397.45 **5 Claims**

21-Chloro - 17 - acyloxy - 20-ketosteroids, are prepared from the corresponding 17,21-dihydroxy-20-ketosteroid, cyclic 17,21-orthoesters in a single step process which comprises the reaction of a 17,21-dihydroxy-20-ketosteroid, cyclic 17,21-orthoester with triphenylmethyl chloride.

3,832,367

ALKOXYLATED HYDROXYAMIDE DETERGENTS

El-Ahmadi Ibrahim Heiba, Princeton, and Paul Gerhard Rodewald, Rocky Hill, N.J., assignors to Mobil Oil Corporation

No Drawing. Filed Sept. 28, 1971, Ser. No. 184,633

Int. Cl. C07c *103/30;* **C11d** *3/066*

U.S. Cl. 260—404 **9 Claims**

A novel class of biodegradable detergents having improved dispersion properties in hard water are the water-soluble reaction products obtained by reacting a lactone with an alkanolamine and further reacting the resulting hydroxyalkanolamide with an alkylene oxide. Maintaining a preferred ratio of the number of moles of alkylene oxide reacted with the intermediate amide product to the total number of carbon atoms in the lactone precursor within a specific range has been found to provide products having optimum detergency properties. Amide products having from 8 to 30 carbon atoms in the acid portion and containing from about 1.5 to about 20 total ethylene oxide units are most preferred.

3,832,368

LITHIUM POLYCYANOETHYLATED KETO FATTY SOAP BASED GREASES

Harold E. Kenney, Jenkintown, Edward T. Donahue, Philadelphia, and Gerhard Maerker, Oreland, Pa., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed July 25, 1972, Ser. No. 275,010
Int. Cl. C08h 17/36
U.S. Cl. 260—404 1 Claim

Keto fatty acids or derivatives of keto fatty acids are cyanoethylated and the resulting three carbon cyanoethyl branched chain fatty acids are mixed with an appropriate amount of a diester or a petroleum base oil. The mixture is then reacted in situ with a dilute aqueous solution of lithium hydroxide to obtain a stable grease.

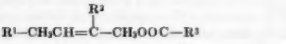
3,832,369

ESTERS OF DIALKYLALLYL ALCOHOLS

Alfred A. Schleppnik, St. Louis, Mo., and John B. Wilson, Old Bridge, N.J., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Jan. 14, 1972, Ser. No. 217,957
Int. Cl. C07c 69/14, 69/24; C11b 9/00
U.S. Cl. 260—410.9 N 4 Claims

Esters of dialkylallyl alcohols characterized by the structural formula



wherein R^1 and R^2 each represent a lower alkyl, and R^3 represents hydrogen, a lower alkyl or lower alkenyl of from 1 to 8 carbon atoms, aryl, aralkyl or arylalkenyl are prepared by selective reduction of suitable acroleins followed by esterification. The compounds have very pleasant, strong and long lasting aromas and are useful as compounds in fragrance compositions.

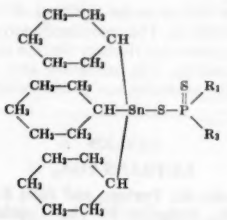
3,832,370

ORGANOTIN MITICIDAL AND INSECTICIDAL COMPOUNDS

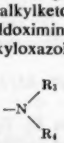
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Oct. 19, 1972, Ser. No. 304,871
Int. Cl. C07j 7/22
U.S. Cl. 260—429.7 31 Claims

A composition of matter is described herein which has insecticidal and miticidal activity and methods of use. The composition may be defined by the following generic formula



wherein R_1 is lower alkyl having 1 to 4 carbon atoms, and R_2 can be selected from alkylketoximino, piperidyl, cycloalkylketoximino, alkylaldoximino, alkylcarbamylalkoxy, hexamethyleneimino, alkyloxazolidine, and



wherein R_3 and R_4 can be the same or different and can be selected from hydrogen, alkyl having 1 to 15 carbon atoms, alkoxyalkyl, alkenyl, benzyl, cyanoalkyl, alkanol, phenyl, alkylphenyl, sulfonamidophenyl, thiazolinyl, alkoxycarbamyl, halobenzyl, furfuryl, provided that when R_3 is hydrogen, R_4 is other than hydrogen.

3,832,371

NOVEL NICKEL ALCOHOLATES AND ALCOHOLS THEREOF AND A PROCESS OF THEIR PRODUCTION

Gunther Wilke and Paul Heimbach, Mulheim (Ruhr), Germany, assignors to Studiengesellschaft Kohle mbH., Mulheim (Ruhr), Germany

No Drawing. Original application Oct. 26, 1967, Ser. No. 678,172, now Patent No. 3,544,604. Divided and this application July 29, 1970, Ser. No. 64,845
Claims priority, application Germany, May 26, 1967, ST 26,928
Int. Cl. C07f 15/04
U.S. Cl. 260—439 R 6 Claims

Process of producing nickel alcoholates by reacting π-allyl nickel compounds with carbonyl compounds. The nickel alcoholates so produced can be hydrolyzed to their corresponding alcohols and these alcohols can in part be dehydrated to their corresponding olefins. The nickel alcoholate products are useful for the production of their corresponding alcohols and these alcohols are useful for the production of their corresponding olefins.

3,832,372

CONTINUOUS PROCESS FOR PREPARING AROMATIC ISOCYANATES

Philip D. Hammond and William M. Clarke, North Haven, and William I. Denton, Cheshire, Conn., assignors to Olin Corporation

Filed Oct. 12, 1972, Ser. No. 296,952
Int. Cl. C07c 119/04
U.S. Cl. 260—453 PC 16 Claims

Aromatic isocyanates are produced directly from aromatic nitro compounds in a continuous process in which cabron monoxide and an aromatic nitro compound are reacted in a reaction zone in the presence of a catalyst and a solvent to form an aromatic isocyanate. A gaseous product of the reaction zone is collected and cooled to yield a fraction of unreacted carbon monoxide in gaseous form, which is condensed, purified and recycled to the reaction zone, and another fraction of liquified solvent, which is also recycled to the reaction zone. The slurry product of the reaction zone is collected, cooled and separated into a solid component and a liquid component. The solid component, which is predominantly catalyst, is recycled to the reaction zone with or without regeneration. The liquid component is distilled to separate aromatic isocyanate product from the distillation residue which predominates in unreacted aromatic nitro compound and solvent, the latter residue being recycled to the reaction zone. The aromatic isocyanate product is useful as a reactant in the preparation of polyurethanes.

3,832,373

HYDROXAMIC ACID DERIVATIVES OF 1-AMINOCYCLOHEXANECARBOXYLIC ACID

Harvey E. Alburn, West Chester, Donald E. Clark, Norristown, Norman H. Grant, Wynnewood, and Milton Lapidus, Rosemont, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application Nov. 5, 1969, Ser. No. 874,382, now Patent No. 3,703,542. Divided and this application May 22, 1972, Ser. No. 255,825
Int. Cl. C07c 119/16
U.S. Cl. 260—453 R 3 Claims

The compounds are hydroxamic acids of alicyclic amino acids and esters of said compounds, all of which have valuable pharmacodynamic properties in that they relieve hyperglycemia in warm-blooded animals.

3,832,374

NOVEL ARYLTHIOCARBAMATE

Horst Liebig, Wunstorf, and Gunter Dransch, Eschborn, Germany, assignors to Riedel-De Haen Aktiengesellschaft, Seelze, Germany

No Drawing. Filed Aug. 17, 1971, Ser. No. 172,584

Claims priority, application Germany, Aug. 20, 1970, P 20 41 391.6

Int. Cl. C07c *155/02, 155/08*
U.S. Cl. 260—455 A 1 Claim

4 - Acetyl-phenyl-N-methyl-N-3-tolyl-thiocarbamate can be used in fungicides and in cosmetics and may be prepared by reacting N-methyl-N-3-tolyl-thiocarbamoyl chloride with 4-hydroxyacetophenone or by reacting 4-acetyl-phenyloxy thiocarbonyl chloride with N-methyl-3-toluidine.

3,832,375

CARBONIC ACID ESTERS

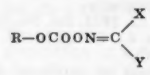
Masumi Itoh, Cleveland Heights, Ohio, assignor to Fujisawa Pharmaceutical Co., Ltd.

No Drawing. Filed Aug. 9, 1972, Ser. No. 279,086

Claims priority, application Japan, Aug. 13, 1971, 46/61,820; Oct. 7, 1971, 46/79,295

Int. Cl. C07c *67/00, 131/00*
U.S. Cl. 260—463 18 Claims

A process for esterifying organic carboxylic acids which comprises reacting an organic carboxylic acid with a carbonic acid ester of the formula:



wherein R is an organic group and X and Y are each a negative group in the presence of a basic substance to make esterified the carboxyl group in the organic carboxylic acid. The process is advantageous in affording the objective carboxylic ester in a good yield within a short time by a simple operation under a mild reaction condition.

3,832,376

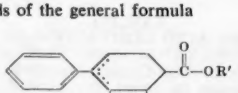
DERIVATIVES OF THE 2-(LOWER ALKYL)-3 (LOWER ALKYL)-4-PHENYL-3- OR 4-CYCLOHEXENECARBOXYLIC ACIDS

George Karmas, Bound Brook, N.J., assignor to Ortho Pharmaceutical Corporation

No Drawing. Continuation-in-part of application Ser. No. 763,026, Sept. 26, 1968, now Patent No. 3,629,269. This application Mar. 11, 1971, Ser. No. 123,471

Int. Cl. C07c *69/76*
U.S. Cl. 260—469 3 Claims

Compounds of the general formula



are disclosed wherein R'' and R''' are selected from the group consisting of lower alkyl of up to 3 carbon atoms; and R' is selected from the group consisting of secondary alkyl of from 9 to 20 carbon atoms, alkenyl of from 3 to 20 carbon atoms, 1-adamantyl, 2-adamantyl, cyclopentyl; and the dotted lines represent a double bond at either the 3- or the 4-position. These compounds are active suppressants of reproduction in low doses when administered orally or parenterally. When given in a single subcutaneous and/or oral dose, some of these compounds have long acting effects in the suppression of animal reproduction.

3,832,377

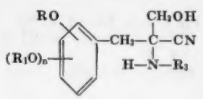
2-ACETAMIDO-2-(3,4-DIOXYBENZYL)-3-HYDROXY-PROPIONITRILES

Donald F. Reinhold and Meyer Sletzinger, North Plainfield, and Raymond A. Firestone, Fanwood, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original applications Mar. 6, 1964, Ser. No. 350,111, now Patent No. 3,395,176, dated July 30, 1968, and Sept. 7, 1967, Ser. No. 675,729. Divided and this application May 29, 1969, Ser. No. 829,129

Int. Cl. A61k *27/00;* C07c *121/66*
U.S. Cl. 260—465 D 2 Claims

The invention comprises compounds of the formula



in which

R and R_1 are selected from the group consisting of hydrogen, lower alkyl (no more than one of R and R_1 being hydrogen) and, together, are methylene;

R_3 is selected from the group consisting of acetyl and formyl; and

n is a number from 0 to 2.

The compounds are useful as decarboxylase inhibitors and anti-hypertensive agents.

3,832,378

α-(CHLOROTHIO)ISOBUTYRONITRILE, α - (CHLORODITHIO)ISOBUTYRONITRILE AND THEIR PREPARATION; AND PREPARATION OF α,α'-DITHIOBISISOBUTYRONITRILE

Howard A. Hageman, Southbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed Mar. 6, 1972, Ser. No. 232,252

Int. Cl. C07c *121/02, 121/16, 121/20*
U.S. Cl. 260—465.1 9 Claims

The invention relates to the synthesis of novel derivatives of isobutyronitrile. The compounds derived from this synthesis are α-(chlorothio)isobutyronitrile and α-(chlorodithio)isobutyronitrile. The invention also relates to a novel method for preparing α,α'-dithiobisisobutyronitrile.

3,832,379

5,6-TRANS PGA_2

Frank H. Lincoln, Jr., Portage, and John E. Pike, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 72,511, Sept. 15, 1970, and a division of application Ser. No. 157,651, June 28, 1971, now Patent No. 3,759,978. This application Apr. 23, 1973, Ser. No. 353,480

Int. Cl. C07c *61/36, 69/74*
U.S. Cl. 260—468 D 13 Claims

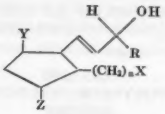
5,6-Trans-prostaglandins E_2, $F_{2\alpha}$, $F_{2\beta}$, A_2, and B_2 are disclosed. These are useful for the same pharmacological purposes as the known prostaglandins PGE_2, $PGF_{2\alpha}$, $PGF_{2\beta}$, PGA_2, and PGB_2.

3,832,380
PRODUCTION OF CYCLOPENTANE DERIVATIVES

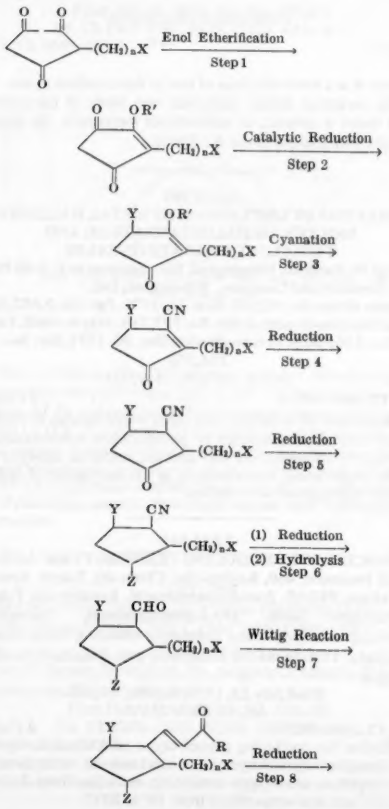
Masanao Matsui, Tokyo; Junki Katsube, Osaka, and Eichi Murayama, Hyogo, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Sept. 9, 1970, Ser. No. 70,877
Claims priority, application Japan, Sept. 9, 1969, 44-71785; Nov. 18, 1969, 44-92746; Nov. 18, 1969, 44-92747; Jan. 31, 1970, 45-8670
Int. Cl. C07c *61/32, 69/74*
U.S. Cl. 260—468 D 6 Claims

A process for producing cyclopentane derivatives of the formula



wherein R is hydrogen or a C_1 to C_6 alkyl group, X is a carboxyl or a carboalkoxy group, and the like; Y and Z each is a hydroxyl group, and the like; and n is an integer of from 5 to 7. The derivatives are useful as medicines. The process of this invention comprises the steps shown in the following reaction scheme:



wherein R, X, Y, Z and n are as defined above, and wherein R′ is lower alkyl group.

3,832,381
CHEMICAL PROCESSES USING ORGANOTHALLIUM COMPOUNDS

Edward C. Taylor, and Alexander McKillop, both of 1500 Spring Garden St., Philadelphia, Pa. 19101

Division of Ser. No. 700,352, Jan. 25, 1968, Pat. No. 3,626,018. This application Feb. 4, 1971, Ser. No. 112,815
Int. Cl. C07c *69/00, 49/04, 49/44*
U.S. Cl. 260—468 K 8 Claims

Thallous salts of β-dicarbonyl compounds, prepared by reaction of the β-dicarbonyl compounds with a thallous alkoxide, are treated with alkyl halides to give C-alkyl products in high yield, with acyl halides at room temperature to give C-aryl products, and with acyl halides at low temperatures to give O-acyl products. Thallous phenolates are esterfied with acyl or aroyl halides. Anhydrides are also prepared, as are biaryls and bi-sec-alkyls. N-Heterocyclics, including purines and pyrimidines, are N-alkylated. Lactams are O-acylated or N-alkylated.

3,832,382
3,11-DIOXOOLEANA-5,12-DIEN-30-OIC ACID, ESTERS THEREOF AND DERIVATIVES

John S. Baran, Winnetka, and Barnett Pitzele, Skokie, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 172,903, Aug. 18, 1971, Pat. No. 3,755,414. This application May 29, 1973, Ser. No. 364,974
Int. Cl. C07c *61/36, 69/74*
U.S. Cl. 260—468.5 6 Claims

The above-captioned compounds are manufactured from alkyl esters of 3-nor-4,4-desmethyl-4-isopropylidene-11-oxoolean-12-en-30-oic acid. The instant compounds are useful as pharmacological agents as is evidenced by their antibacterial and antiviral activity.

3,832,383
HERBICIDAL ACYLOXYALKYL ANILIDES

John F. Olin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 148,894, June 1, 1971. This application Dec. 2, 1971, Ser. No. 204,330
Int. Cl. C07c *103/32*
U.S. Cl. 260—469 7 Claims

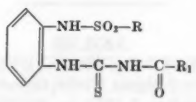
Herbicidal acyloxyalkyl-2-halo-substituted acetanilides.

3,832,384
THIOUREIDO SULFONANILIDE COMPOSITIONS

Alexander Mihailovski, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Dec. 29, 1971, Ser. No. 217,697
Int. Cl. C07c *157/06*
U.S. Cl. 260—470 29 Claims

New compounds corresponding to the generic formula:



wherein R can be selected from lower alkyl, lower haloalkyl, phenyl, substituted phenyl wherein said substituents can be selected from halogen and lower alkyl; R_1 can be selected from lower alkyl, lower alkoxy and lower thioalkyl. The compounds are useful fungicides and biocides.

3,832,385

SUBSTITUTED 4-ALKYLTHIOBENZOIC ACID ESTERS

John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 60,636, Aug. 3, 1970, abandoned. This application May 5, 1972, Ser. No. 269,692
Int. Cl. C07c *149/40*
U.S. Cl. 260—470 4 Claims

Novel phenyl compounds of formulas I, II, III and IV and intermediates useful for control of insects.

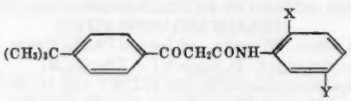
3,832,386

COLOR PHOTOGRAPHIC MATERIAL

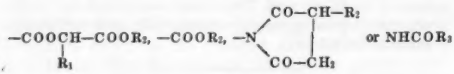
Isaburo Inoue; Teruo Hanzawa; Takaya Endo, and Hidetaka Deguchi, all of Tokyo, Japan, assignors to Kanishiroku Photo Industry Co., Ltd.

Filed May 13, 1971, Ser. No. 143,241
Claims priority, application Japan, May 14, 1970, 45-40492
Int. Cl. C07c *103/30*
U.S. Cl. 260—471 R 2 Claims

A yellow color image-forming coupler, useful as a protect type coupler in a light-sensitive silver halide color photographic emulsion. The coupler has the general formula



wherein X is hydrogen, halogen, a lower alkoxy group, a lower alkyl group or an aryloxy group; and Y is



where R_1 is a lower alkyl group; R_2 is a hydrocarbon residue having eight to 18 carbon atoms; and COR_3 is an acyl group having nine to 20 carbon atoms.

3,832,387

ALPHA-NITRO-CINNAMIC ACID DERIVATIVES

Alan Martin Krubiner, Montville, and Eugene Paul Oliveto, Glen Ridge, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed Mar. 16, 1972, Ser. No. 235,421
Int. Cl. C07c *79/46*
U.S. Cl. 260—471 A 7 Claims

α-nitro-cinnamic acid derivatives which are useful in preparing phenylalanines, and a process for obtaining the derivatives by treating the corresponding cinnamic acid esters with nitric oxide or nitrogen dioxide.

3,832,388

RESOLUTION OF 2-(P-HYDROXY)PHENYLGLYCINE

Roman R. Lorenz, 3 Highland Drive, Greenbush, N.Y. 12061

Filed Sept. 7, 1972, Ser. No. 287,136
Int. Cl. C07c *101/06*
U.S. Cl. 260—471 A 22 Claims

Optically pure D-(−)- and L-(+)-2-(p-hydroxyphenyl)-glycine, intermediates in the preparation of penicillin and cephalosporin derivatives, are prepared by chemical resolution of an ester of racemic 2-(p-hydroxyphenyl)glycine, employing L-(−)- or D-(+)-dibenzoyltartaric acid as resolving agent, and conversion to the free acid of the D-(−)- and L-(+)-2-(p-hydroxyphenyl)glycine ester so obtained.

3,832,389

SUBSTITUTED CHLOROCARBONYLUREA

Karl-Heinz Koenig, Frankenthal; Rudolf Kolbinger, Speyer; Bernd Zeeh, Ludwigshafen, and Adolf Fischer, Mutterstadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed Mar. 17, 1972, Ser. No. 235,656
Int. Cl. C07c *127/18*
U.S. Cl. 260—479 C 1 Claim

New and valuable substituted chlorocarbonylureas having good herbicidal properties and a process for controlling the growth of unwanted plants with these compounds.

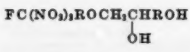
3,832,390

ENERGETIC POLYNITRO HALOGENATED DIOL ETHERS

Milton B. Frankel, Tarzana, and Edward F. Witucki, Sepulveda, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 21, 1968, Ser. No. 779,311
Int. Cl. C07c *69/62, 43/12*
U.S. Cl. 260—487 4 Claims

This invention is concerned with novel, monomeric, aliphatic diols of the general formula:



wherein R is a lower alkylene of one to three carbon atoms.

This invention herein described was made in the course of or under a contract or subcontract thereunder, (or grant) with the Department of the Air Force.

3,832,391

CATALYSIS BY DISPERSIONS OF METAL HALIDES IN MOLTEN TRIHALOSTANNATE (II) AND TRIHALOGERMANATE (II) SALTS

George W. Parshall, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 92,541, Nov. 24, 1970, Pat. No. 3,657,368, Continuation-in-part of Ser. No. 727,710, May 8, 1968, Pat. No. 3,565,823. This application Dec. 30, 1971, Ser. No. 214,376
Int. Cl. C07c *51/14, 45/08*
U.S. Cl. 260—497 A 9 Claims

Dispersions of transition and other metal halides in molten tetrahydrocarbylammonium or phosphonium trihalostannate (II) and trihalogermanate (II) salts are useful as catalysts for the hydrogenation, isomerization or carbonylation of olefins and the hydrogenation of nitriles.

3,832,392

PROCESS FOR PRODUCING PERISOBUTYRIC ACID

Juichi Imamura, 460, Kojima-cho, Chofu-shi, Tokyo; Kyoichi Wakasa, 592-65, Jyosui-minamimachi, Kodaira-shi, Tokyo; Takeshiro Saito, 233,Kaminoge-machi, Tamagawa, Setagaya-ku, Tokyo, and Tomeyoshi Ishikawa, 1583, Shimonilkura, Yamato-machi, Kitaadachi-gun, Saitama-ken, all of Japan

Filed July 23, 1970, Ser. No. 57,806
Int. Cl. C07c *73/10*
U.S. Cl. 260—502 A 4 Claims

Process for producing perisobutyric acid which comprises oxidizing isobutyraldehyde in an inert solvent under pressure of oxygen or an oxygen-containing inert gas from 2 to 50 kg./cm² and at a temperature from 10° to 80°C.

3,832,393

PROCESS OF PRODUCING AMINO ALKYLENE PHOSPHONIC ACIDS

Friedrich Krueger, Edingen, and Lieselotte Bauer, Bad Duerkheim, both of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen am Rhine, Germany

Filed Apr. 16, 1971, Ser. No. 134,873
Int. Cl. C07f 9/38; C02b 5/06
U.S. Cl. 260—502.5 **16 Claims**

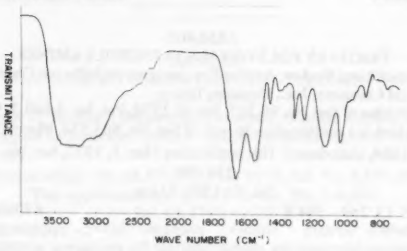
Amino alkylene phosphonic acids such as ethylene diamine tetra-(methylene phosphonic acid), diethylene triamine penta-(methylene phosphonic acid), nitrilo tris-(methylene phosphonic acid), and others are obtained in a high yield by reacting alkylene glycol chlorophosphites with an aldehyde or ketone and an amine or an acid addition salt thereof or an acid amide of a lower mono- or dicarboxylic acid, such as formamide, oxamide, or urea. The resulting reaction solution can directly be added to fluid or solid cleaning agents or the substantially pure amino alkylene phosphonic acid can be recovered therefrom.

3,832,394

METHANEPHOSPHINYLETHANE SUBSTITUTED AMID TRIMER OF ALANINE

Taro Niida; Shigeharu Inoue, both of Yokohama; Takashi Tsuruoka, Kawasaki; Takashi Shomura, Yokohama; Yasumitsu Kondo, Yokohama; Yasuaki Ogawa, Yokohama; Hiroshi Watanabe, Yokohama; Yasuharu Sekizawa, Tokyo; Tetsuro Watanabe, Yokohama, and Hiroshi Igarashi, Chigasaki, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed July 17, 1972, Ser. No. 272,676
Int. Cl. C07f 9/46; A61k 27/00; A01n 9/36
U.S. Cl. 260—502.5 **1 Claim**



New antibiotic SF-1293 substance and a microbiological process for the production thereof. SF-1293 substance can be produced by cultivation of Streptomyces hygroscopicus SF-1293 (ATCC 21705) SF-1293 substance can be used to control various fungal infections of plants, for example, sheath blight and rice blast of rice plant, and to treat trichophytosis, as SF-1293 substance exhibits the growth of various fungi such as Pellicularia sasakii, Piricularia oryzae and Trichophyton asteroides.

3,832,395

METHOD FOR THE PRODUCTION OF PHTHALIC AND TOLUIC ACIDS BY THE CATALYTIC OXIDATION OF XYLENES

Henry R. Grane, Springfield, Pa., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 18, 1972, Ser. No. 316,186
Int. Cl. C07c 51/20, 63/26; C07C 63/02
U.S. Cl. 260—524 R **8 Claims**

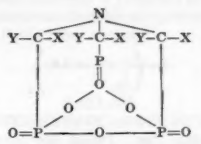
Method for the production of phthalic and toluic acids by the catalytic oxidation of a xylene or a mixture of the xylene isomers utilizing air or gas containing molecular oxygen as the primary oxidation agent in conjunction with an isobutane oxidate as a secondary agent. A cobalt salt is the preferred catalyst; however, the salts of metals having atomic numbers 23 – 29 inclusive, can be utilized. The oxidation is carried out at temperatures in the range of from about 220°F. to 320°F., at pressures ranging from 100 to 1,000 psig.

3,832,396

ANHYDRIDES OF ORGANO-PHOSPHONIC ACIDS

Riyad R. Irani, and Robert S. Mitchell, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 538,198, March 29, 1966, abandoned. This application May 7, 1969, Ser. No. 824,378
Int. Cl. C07f 9/28, 9/38
U.S. Cl. 260—545 P **1 Claim**



This invention relates to anhydrides of organo-phosphonic acids such as the anhydride of amino tri(lower alkylidene phosphonic acids) and processes for preparing said anhydrides. An example of the novel anhydrides of the present invention is shown by the following formula (X and Y being hereinafter defined).

3,832,397

PROCESS FOR SUBSTITUTED SULFONYLUREAS

Harvey Gurien, Maplewood; Albert Israel Rachlin, Verona, and Sidney Teitel, Clifton, all of N.J., assignors to Hoffman-La Roche Inc.,, Nutley, N.J.

Continuation-in-part of Ser. No. 21,181, Mar. 19, 1972, abandoned. This application Oct. 10, 1972, Ser. No. 296,483
Int. Cl. C07c 127/12
U.S. Cl. 260—553 D **4 Claims**

Bicyclic sulfonylurea derivatives have been prepared by reacting (1R)-3-endo-amino-2-endo-bornanol, hereinafter referred to as (D)-3-endo-aminoborneol, with alkylphenylsulfonyl ureas. The bicyclic sulfonylurea derivatives are useful as hypoglycemic agents.

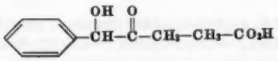
3,832,398

D-5-HYDROXY-5-PHENYLLEVULINIC ACID AND SALTS THEREOF

Eugene Raymond Wetzel, Spring Valley, and Donald Bruce Borders, Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 29, 1971, Ser. No. 129,224
Int. Cl. C07c 65/20
U.S. Cl. 260—521 R **1 Claim**

The new compound of the formula:



is prepared by the cultivation under controlled aerobic conditions of Tuberculoria strain Z1497. Said compound exhibits marked analgesic properties when administered to mammals.

3,832,399

NITRILE IMINES

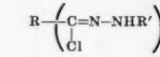
David S. Breslow, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 720,430, Feb. 2, 1968, abandoned, which is a division of Ser. No. 447,887, April 13, 1965, Pat. No. 3,418,285. This application Apr. 6, 1971, Ser. No. 131,824

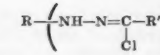
Int. Cl. C07c *119/00*

U.S. Cl. 260—566 D 10 Claims

Disclosed are polyfunctional nitrile imines having the formula selected from $R\text{+}C \equiv N^{+}\text{—}N^{-}\text{—}R')x$ and $R\text{+}N^{-}\text{—}N^{+} \equiv C\text{—}R'')x$ where R is an alkylene, cycloalkylene, arylene, alkyl-arylene, arylene-dialkylene, alkylene-diarylene or cycloalkylene-dialkylene radical; R′ is a hydrogen, alkyl, cycloalkyl, aryl, alkaryl, or aralkyl radical; R″ is an alkyl, cycloalkyl, aryl, alkaryl or aralkyl radical and x is greater than 1; and their hydrogen chloride salts having the formula selected from



and



where R, R′, R″ and x are as defined above which are useful cross-linking agents used in curing unsaturated polymers.

3,832,400

CARBAMOYL OXIMES

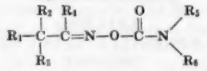
Willy Meyer, Basel, and Beat Boehner, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 9, 1972, Ser. No. 279,139

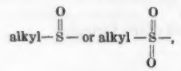
Int. Cl. C07c *119/00*

U.S. Cl. 260—566 AC 10 Claims

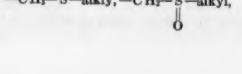
New carbamoyl oximes, their manufacture and their pesticidal activity especially against insects and representatives of the order acarina are disclosed. The compounds correspond to the formula



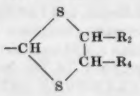
wherein R_1 represents alkylthio,



R_2, R_4 and R_5 each represents hydrogen or alkyl, R_3 represents $-CH_2$-alkoxy, $-CH_2$-alkylthio, $-CH(alkylthio)_2$, $-CH(alkoxy)_2$,



$-CH_2$-alkenyloxy, $-CH_2Cl$, $-CHO$ or



and R_6 represents hydrogen, alkyl, alkenyl or acetyl.

3,832,401

HOMOGENEOUS CATALYSTS USEFUL IN THE REDUCTION OF NITROAROMATICS TO AMINES

John F. Knifton, Poughquag, and Robert M. Suggitt, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 4, 1971, Ser. No. 121,132

Int. Cl. C07c *85/10*

U.S. Cl. 260—570.8 R 1 Claim

This invention concerns the use of homogeneous ruthenium and iron catalyst complexes preferably stabilized by a displaceable ligand such as triphenyl phosphine, and/or solubilized by a solvating agent such as the lower alkanols, said catalyst complexes being utilized as reducing agents in the presence of a non-aqueous, non-oxidizing reaction medium, at reaction temperatures of from about 35° to 160° C and under superatmospheric pressures of at least 100 psig, in a substantially hydrogen atmosphere, to selectively reduce at least one nitro group of nitroaromatics to the corresponding aromatic amine.

3,832,402

TERTIARY POLYOXYALKYLENEPOLYAMINES

Ernest Leon Yeakey, Austin, Tex., assignor to Jefferson Chemical Company, Inc., Houston, Tex.

Division of Ser. No. 96,247, Dec. 8, 1970, Pat. No. 3,660,319, which is a continuation-in-part of Ser. No. 803,934, March 3, 1969, abandoned. This application Mar. 1, 1972, Ser. No. 230,990

Int. Cl. C07c *93/04*

U.S. Cl. 260—584 B 8 Claims

New tertiary amines prepared from polyoxyalkylenepolyamines are useful catalysts for preparing urethane foams. The new tertiary amines are prepared by alkylation of the polyoxyalkylenepolyamine with an aldehyde and hydrogenation of the product.

3,832,403

METHOD FOR REACTING ORGANIC HALIDES

Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

Continuation-in-part of Ser. No. 119,908, March 1, 1971, abandoned. This application Mar. 9, 1973, Ser. No. 339,637

Int. Cl. C07c *49/76*, *49/82*

U.S. Cl. 260—592 18 Claims

A method for carrying out reactions of the Friedel-Crafts type, such as alkylation, acylation, polymerization, sulfonylation and dehydrohalogenation. The reactions are catalyzed by arene-metal tricarbonyl complexes and when the reaction vessel contains aromatic substrates the catalyst may be generated in situ from a metallic hexacarbonyl. The arene-metal tricarbonyl catalyst is more selective than conventionally employed Friedel-Craft catalysts in that it yields generally para isomers with little of the ortho variety and very little if any of the meta variety when the aromatic substrate is reacted with organic

halide. It is also possible to form the arene-metal tricarbonyl catalyst outside of the reaction vessel and then proceed by adding it to the vessel containing the substrate and the organic halide as is the case with dehydrohalogenation reactions wherein there are no aromatic rings available, the substrate in that instance being aliphatic.

3,832,404
HYDROFORMYLATION PROCESS

Keith George Allum, Bracknell; Ronald David Hancock, Weybridge; Samuel McKenzie, Richmond, and Robert Chalmers Pitkethl, Camberley, all of England, assignors to The British Petroleum Company, London, England

Filed Dec. 14, 1970, Ser. No. 98,030

Claims priority, application Great Britain, Dec. 19, 1969, 61920/69; Sept. 30, 1970, 46614/70; Nov. 20, 1970, 56219/70

Int. Cl. C07c *27/22, 29/16, 47/02*

U.S. Cl. 260—604 HF **7 Claims**

A heterogeneous hydroformylation process in which an olefin is reacted with CO and H_2 is effected in the presence of a catalyst containing units of formula

where Z is a residue obtained by removing an —OH group from a solid inorganic material containing —OH groups, e.g., silica and Q is a group containing phosphorus bonded to a transition metal, e.g., fhodium or cobalt.

3,832,405
5-CYCLOALKYLIDENE DIBENZOCYCLOHEPTENE DERIVATIVES

Leslie G. Humber, Dollard des Ormeaux, Quebec, Canada, assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 38,571, May 18, 1970, Pat. No. 3,697,581. This application Apr. 24, 1972, Ser. No. 246,690

Int. Cl. C07c *43/20*

U.S. Cl. 260—612 R **4 Claims**

There are disclosed new derivatives of 5-cyclohexylidene-5H-dibenzo[a,d]cycloheptene which are substituted at either position 2 or at both positions 2 and 8 with hydroxyl, lower acyloxy, or an aminoethoxy radical, such as, diethylaminoethoxy, dimethylaminoethoxy, pyrrolidinoethoxy, piperidinoethoxy or morpholinoethoxy, as well as the acid addition salts with pharmaceutically acceptable acids of those derivatives containing the aminoethoxy radicals. The derivatives are useful as antigonadotrophic agents substantially free from estrogenic effects, and methods for their preparation and use are given.

3,832,406
PRODUCTION OF MONOCHLORODIMETHYL ETHER

Arthur Stock, 8 Farndale Ave., South Bents, Sunderland, County Durham, and Allan William Baxter, 10 Charlcote Cres., East Boldon, County Durham, both of England

Filed May 27, 1970, Ser. No. 40,975

Claims priority, application Great Britain, June 2, 1969, 27751/69

Int. Cl. C07c *41/10, 41/00*

U.S. Cl. 260—614 R **2 Claims**

A process for the production of monochlorodimethyl ether which comprises continuously contacting, in a first zone, hydrogen chloride with a mixture of methanol or methylal and formaldehyde, allowing the reacting mixture to pass under the influence of the heat of reaction into a reflux zone wherein heat is removed to condense it, condensed material returning to the first zone, and removing reacted material from the first zone and cooling it in the presence of excess hydrogen chloride.

3,832,407
PREPARATION OF BERYLLIUM HYDRIDE ETHERATE

Paul F. Reigler, Midland, and Lz F. Lamoria, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 2, 1965, Ser. No. 437,637

Int. Cl. C07c *43/30*

U.S. Cl. 260—615 B **4 Claims**

Beryllium Hydride Etherate is prepared by reacting a solution of Sodium Aluminum Hydride and a solution of Beryllium Borohydride in a liquid Ether material.

3,832,408
ETHOXYLATED HYDROCARBYL BUTANEDIOLS

Robert G. Anderson, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 798,162, Feb. 10, 1969. This application May 14, 1971, Ser. No. 143,596

Int. Cl. C07c *43/04, 43/14*

U.S. Cl. 260—615 B **2 Claims**

New compositions of matter useful in phosphate-free detergent compositions comprise the 2-hydrocarbyl-1,4-butanediol ethoxylate disulfates.

3,832,409
ALDEHYDE CONDENSATION PRODUCTS OF FLUOROALIPHATIC PHENOLS

Leland S. Endres, 1351 Fernwood Dr., San Luis Obispo, Calif. 93401; Leo F. Gehlhoff, and Dallas D. Zimmerman, both of 3M Center, Saint Paul, Minn. 55101

Filed Oct. 29, 1970, Ser. No. 85,278

Int. Cl. C07c *39/26*

U.S. Cl. 260—619 A **14 Claims**

Condensation products of aldehydes and fluoroaliphatic phenols are substantive to wool, synthetic polyamides, leather and skin, the compositions preferably being extended with a suitable pharmaceutical medium. The condensation products are useful for the preparation of compositions that render such materials oil and water repellent.

3,832,410
SURFACE CRYSTALLIZATION PROCESS

Delmar O. Hug, Edwardsville, and Taniel A. Garabedian, Belleville, both of Ill., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 150,725, June 7, 1971, abandoned. This application June 7, 1973, Ser. No. 367,993

Int. Cl. C07c *79/12*

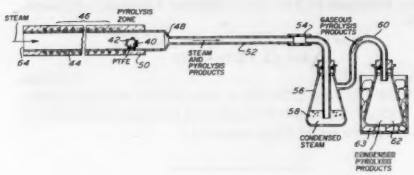
U.S. Cl. 260—646 **6 Claims**

Improved purity is achieved in a process for separating the isomers of nitro- and halo-substituted aromatic compounds in a mixture of liquid isomers by fractional, surface crystallization from the melt, wherein the isomeric mixture is cooled until crystals form on a cooling surface. The improvement comprises conducting the fractional, surface crystallization on a glass cooling surface. The process is particularly beneficial for separating para-nitrochlorobenzene from a liquid isomeric liquid of ortho-, meta- and para-nitrochlorobenzenes.

3,832,411
METHOD FOR THE DEPOLYMERIZATION OF POLYTETRAFLUOROETHYLENE

Barry C. Arkles, Malvern, and Robert N. Bonnett, West Chester, both of Pa., assignors to Liquid Nitrogen Processing Corporation, Malvern, Pa.

Filed Feb. 2, 1971, Ser. No. 111,963
Int. Cl. C07c *21/18*
U.S. Cl. 260—653.3 **8 Claims**



High yield monomeric tetrafluoroethylene may be recovered from polytetrafluoroethylene and polytetrafluoroethylene composites by pyrolyzing the polymer in the presence of high temperature steam. The steam acts as a condensable carrier gas for the low molecular weight pyrolysis products and should be present in an amount such that the mole ratio of steam to pyrolysis products is at least one to one. The steam also acts as a means for heating the polymer to the necessary decomposition temperatures.

3,832,412
ALLYL HALIDE-MONOOLEFIN CONDENSATION PRODUCT

Steve J. Messina, St. Clair Shores, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 21, 1967, Ser. No. 661,792
Int. Cl. C07c *21/02*
U.S. Cl. 260—654 R **3 Claims**

A distillate fuel having improved cold flow containing a low molecular weight product obtained on reacting an allyl halide and a C_{10} to C_{20} olefin using an aluminum halide as a catalyst, the molar ratio of allyl halide to olefin being from 5:1 to 1:10. This reaction product is characterized by having a molecular weight of from about 550 to about 1,200. A suitable allyl halide is allyl chloride; suitable olefins are decene, dodecene, tetradecene, heptadecene, octadecene and the like.

3,832,413
PREPARATION OF POLYNUCLEAR AROMATIC HYDROCARBONS

Dorothy E. Darling, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 105,700, Jan. 11, 1971, abandoned. This application Aug. 14, 1972, Ser. No. 280,692
Int. Cl. C07c *3/02, 3/09*
U.S. Cl. 260—673 **8 Claims**

Polynuclear aromatic hydrocarbons are prepared by treating a low molecular weight saturated hydrocarbon in the presence of a catalysts comprising rhodium-containing compounds and in the absence of any added or extraneous gas.

3,832,414
DEHYDROCYCLIZATION OF HYDROCARBONS

Masayoshi Oishi, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

Filed Dec. 11, 1972, Ser. No. 314,207
Int. Cl. C07c *3/02, 3/09*
U.S. Cl. 260—673.5 **7 Claims**

Process of dehydrocyclizing C_6–C_{10} hydrocarbons having at least a C_6 backbone using a Li, Na or K zeolite X or Y impregnated or ion exchanged with 0.1 to 1.2 weight percent Pt and impregnated or ion exchanged with 0.01 to 1.0 weight percent Cd at from 500 to 560 and preferably 510° to 555°C. using a partial pressure of hydrogen of from 10 to 300 p.s.i. and preferably 40 to 200 p.s.i. to form benzene and alkylbenzene.

3,832,415
PROCESS FOR EQUILIBRATING ALLENE AND METHYLACETYLENE AND FOR RECOVERY OF PURE ALLENE FROM THE EQUILIBRIUM MIXTURE

Edward S. Rothman, North Hills, and Samuel Serota, Philadelphia, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 176,735, Aug. 31, 1971, Pat. No. 3,745,195. This application Dec. 15, 1972, Ser. No. 315,684
Int. Cl. C07c *7/00*
U.S. Cl. 260—678 **5 Claims**

Methylacetylene and allene are equilibrated by contact with potassium hydroxide in an inert solvent such as t-butanol. When mixtures of methylacetylene and allene are used in a chemical reaction such as the preparation of isopropenyl stearate from stearic acid and zinc stearate is the sole catalyst, methylacetylene is selectively absorbed by the stearic acid leaving behind highly purified allene. Alternatively, when potassium stearate is present with the zinc stearate and sufficient stearic acid is present, the allene-methylacetylene mixture is completely absorbed. The zinc stearate-potassium stearate co-function synergistically.

3,832,416
PROCESS FOR THE REMOVAL OF CYCLOPENTADIENE FROM HYDROCARBON MIXTURES

Petrus F. A. Van Grinsven, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.

Filed July 16, 1973, Ser. No. 379,271
Claims priority, application Netherlands, July 17, 1972, 7209848
Int. Cl. C07c *7/12*
U.S. Cl. 260—681.5 R **8 Claims**

A process for the removal of cyclopentadiene from a hydrocarbon mixture containing isoprene comprising contacting said hydrocarbon mixture with dehydrated molecular sieve material containing at least one alkali metal and having a pore diameter of more than 0.6 nanometers (nm).

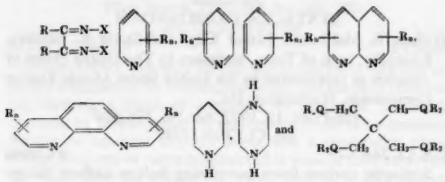
3,832,417
DISPROPORTIONATION PROCESS

Helmut W. Ruhle, Edison, N.J., assignor to Esso Research and Engineering Company, Linden, N.J.

Division of Ser. No. 886,766, Dec. 19, 1969, Pat. No. 3,668,146. This application May 10, 1972, Ser. No. 252,128
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 D **15 Claims**

An improved process for the disproportionation of olefins results by contacting said olefins in the presence of a catalyst prepared by reacting a Group VIB metal carbonyl complex having the general formula $L_eM_a(CO)_c$ wherein L is selected from the group consisting of CO, R_3Q, R_3QO, $(RO)_3Q$, RNH_2,

R_2NH, RCN, R_2SO, $R_3N{-}CN$, $R_3P{=}N{-}CN$, $R_3P{=}NH$, $R_3P{=}CH{-}CH_3$, $R_2Q{-}QR_2$, $R_2Q{-}R^2{-}QR_2$, $R_2Q{-}R^2{-}Q{-}R{-}R^2{-}QR_2$, $R{-}Z{-}R^2{-}Z{-}R$, $R{-}Z{-}R^2{-}Z{-}R^2{-}Z{-}R$



wherein Q is selected from the group consisting of N, P, As and Sb; Z is selected from the group consisting of O and S; X is selected from the group consisting of NR_2, OH, OR and R; R is selected from the group consisting of C_1 to C_{20} hydrocarbyl and hydrogen radicals; and R^2 is selected from the group consisting of divalent C_1 to C_{20} hydrocarbyl radicals; *n* is an integer of from 0 to 2; M is a Group VI-B metal selected from the group consisting of Cr, Mo and W; *a* may vary from 1 to 4; *b* may vary from 1 to 2; and *c* may vary from 2 to 10, with an ionic compound, said ionic compound being selected from the group consisting of compounds having the general formula $R'_4Q'X'$, R'_3ZX', $(R'_4Q')(A1R'_dX'_{4-d})$, $(R'_3Z)(A1R'_dX'_{4-d})$, mixtures of $R'_4Q'X'$ or R'_3ZX' with $A1R'_dX'_{3-d}$ and mixtures thereof wherein R' is selected from the group consisting of C_1 to C_{20} hydrocarbyl radicals and halogenated derivatives thereof, Q' is selected from the group consisting of nitrogen, phosphorous and arsenic, Z is selected from the group consisting of oxygen and sulfur, X' is halogen and *d* may vary from 0 to 3, and said ionic compound being at least partially soluble in said solvent and an activator, said activator comprising an organometallic derivative selected from the group consisting of compounds having the general formula $R''_eA1X'_{(3-e)}$, a mixture of the above compound with a compound having the general formula $A1X'_3$, a compound of the general formula $R''_fM'X'_g$, a mixture of one of several compounds having a formula $R''_fM'X'_g$ with one of the various compounds having the formula $R''_eA1X'_{(3-e)}$ and $A1X'_3$ wherein R'' is selected from the group consisting of C_1—C_{20} hydrocarbyl radicals and the alkoxy and halo derivatives thereof, M' is a metal selected from Groups I through III of the Periodic Table of Elements, X' is halogen, *e* is equal to 1 or 2, *f* is an integer between 1 and 3, and *g* is 0, 1 or 2, the atomic ratios of the metal in said activator to the metal in said metallic complex being from about 20:1 to 1:1, the molar ratio of Cr, Mo or W of said metallic complex to ionic compound being from about 10:1 to 0.1:1, and the molar ratio of said Group I-III metal of said activator to ionic compound being from about 40:1 to 1.5:1.

3,832,418

ISOBUTYLENE DIMERIZATION PROCESS

Paul G. Bercik, Trafford, and Alfred M. Henke, Springdale, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 1, 1972, Ser. No. 249,194
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 R **5 Claims**

A process for selectively dimerizing isobutylene contained in a C_4 olefin mixture employing a catalyst composition comprising a presulfided Group VI or Group VIII metal deposited on an acidic, amorphous silica-alumina support.

3,832,419

ORGANOPOLYSILOXANE-POLYCARBONATE BLOCK COPOLYMERS

Will D. Merritt, Jr., Lenox, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 23, 1973, Ser. No. 344,189
Int. Cl. C08g *47/04*
U.S. Cl. 260—824 R **9 Claims**

An improved process for the preparation of organopolysiloxane-polycarbonate block copolymers from halogen chain-stopped organopolysiloxane, dihydric phenol and phosgene is provided by using ammonia as the acceptor in the initial dihydric phenolhalogen chain-stopped organopolysiloxane reaction, this reaction being followed by phosgenation to form the copolymer.

3,832,420

SILICONE ELASTOMER CONTAINING POLYMONOMETHYLSILOXANE

Harold A. Clark, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sept. 20, 1973, Ser. No. 399,227
Int. Cl. C08g *47/04*
U.S. Cl. 260—825 **4 Claims**

Compositions having at least 10 parts by weight of polymonomethylsiloxane dispersed in 100 parts of a silicone elastomer composition are useful as heat shrinkable materials when in the vulcanized state. The polymonomethylsiloxanes are benzene soluble, further condensable, solid at room temperature, have a melting point not exceeding 125° C., and have a gel time sufficiently long to allow complete dispersion during compounding.

3,832,421

CURABLE COMPOSITIONS CONTAINING SOLID STYRENE-ALLYL ALCOHOL COPOLYMER BASED POLYENES AND POLYTHIOLS

Charles R. Morgan, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed May 5, 1972, Ser. No. 250,729
Int. Cl. C08d *9/10*; C08f *29/20*; B01j *1/10*
U.S. Cl. 260—859 R **16 Claims**

A solid curable composition comprising compatible solid polyene and solid polythiol in which both the components have a similar styrene-allyl alcohol copolymer based backbone. The solid polyene is a reaction product of a copolymer of styrene-allyl alcohol and an unsaturated isocyanate, e.g., ally isocyanate or an unsaturated carboxylic acid such as acrylic acid. The solid polythiol is a reaction product of a copolymer of styrene-allyl alcohol and a mercapto carboxylic acid, e.g., β-mercaptopropionic acid. Upon exposure to a free radical generator, e.g., actinic radiation, this solid polyene-polythiol composition cures to solid, insoluble, chemically resistant, cross-linked polythioether products. Since the polyene-poly-thiol can be cured in a solid state, this curable system finds particular use in preparation of imaged surfaces such as photoresists, printing plates, etc.

3,832,422

FLAME RETARDANT SYSTEMS

Julian R. Little, Hendersonville, N.C.; Walter Nudenberg, West Caldwell, N.J., and Yong S. Rim, Waterbury, Conn., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 80,747, Oct. 14, 1970, abandoned. This application Apr. 3, 1973, Ser. No. 347,455
Int. Cl. C08f *45/58*; C08g *51/58*
U.S. Cl. 260—876 R **18 Claims**

The known compound, 1,2,3,4,9,9-hexachloro-1,4-dihydro-1,4-methanonaphthalene-5,8-diol (I) is an excellent flame retardant for ABS resins and polyurethanes, particularly, polyether-based polyurethanes. Compound I also forms novel

molecular complexes with weak bases such as pyridine, pyridine HCl, pyridine oxide, dimethylsulfoxide and dimethylformamide, and which are excellent flame retardants for ABS resins. Compound I also exhibits unusual synergistic flame retardant effects in ABS resins and other polymers when used together with certain additives that are not themselves flame retardants.

3,832,423

CHEMICALLY JOINED, PHASE SEPARATED GRAFT COPOLYMERS HAVING HYDROCARBON POLYMERIC BACKBONES

Ralph Milkovich, Naperville, and Mutong T. Chiang, Palos Heights, both of Ill., assignors to CPC International, Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. No. 117,733, Feb. 22, 1971, abandoned. This application Apr. 14, 1972, Ser. No. 244,205

Claims priority, application Great Britain, Feb. 8, 1972, 5907/72

Int. Cl. C08f *15/00, 19/00*

U.S. Cl. 260—878 R **22 Claims**

The present invention relates to thermoplastic graft copolymers comprised of copolymeric backbones containing a plurality of uninterrupted repeating units of the backbone polymer and at least one integrally copolymerized moiety per backbone polymer chain having chemically bonded thereto a substantially linear polymer which forms a copolymerized sidechain to the backbone, wherein each of the polymeric sidechains has substantially the same molecular weight and each polymeric sidechain is chemically bonded to only one backbone polymer.

3,832,424

S,S-DIALKYL-N-SUBSTITUTED PHOSPHOROAMIDODITHIONITES

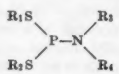
Francis J. Freenor, III, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 20, 1972, Ser. No. 219,559

Int. Cl. C07f *9/24*; **A01n** *9/36*

U.S. Cl. 260—959 **8 Claims**

Compounds of the formula



wherein R_1 and R_2 are independently alkyl of one to eight carbon atoms, or alkenyl of two to eight carbon atoms, R_3 is hydrogen or alkyl of one to four carbon atoms, and R_4 is hydrogen, alkyl of one to four carbon atoms, alkenyl of two to four carbon atoms, aryl of six to 15 carbon atoms optionally substituted with halogen atoms or alkyl groups of one to four carbon atoms or an acyl group of two to four carbon atoms, with the proviso that R_3 and R_4 may be joined to form an alkylene radical of two to five carbon atoms. The compounds possess insecticidal and herbicidal activity.

3,832,425

N-ACYL-O-HYDROCARBYLPHOSPHOROAMIDOTHIOATE SALTS AND PROCESS FOR MAKING SAME

Hans G. Franke, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 21, 1972, Ser. No. 317,479

Int. Cl. C07f *9/24*

U.S. Cl. 260—959 **9 Claims**

S-ammonium (or metal) salts of N-acyl-O-hydrocarbylphosphoroamidothioates are prepared by reacting an N-acyl-O,O-dihydrocarbylphosphoroamidothioate with an ammonium (or metal) sulfide or polysulfide.

3,832,426

SYNTACTIC CARBON FOAM

William B. Malthouse, Lenoir City, and David R. Masters, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Dec. 19, 1972, Ser. No. 316,626

Int. Cl. C01b *31/00*

U.S. Cl. 264—29 **6 Claims**

Syntactic carbon foam comprising hollow carbon microspheres in a carbon matrix is prepared by employing the steps of mixing hollow phenolic resin microspheres with a carbonizable binder consisting of resin and starch particulates, compacting the mixture, gelatinizing the starch in the binder while maintaining the mixture under a load corresponding to a pressure greater than ambient pressure, and then heating the mixture to convert the mixture of spheres and binder to carbon. The use of the resin-starch binder significantly increases the plasticity of the foam during the carbonization step to minimize deleterious internal stressing.

3,832,427

PROCESS FOR CONTINUOUSLY FORMING A POLYMERIC RESINOUS LAYER FROM A MULTICOMPONENT LIQUID REACTIVE MIXTURE

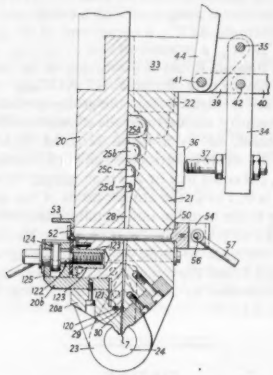
John Mutch, Hartest, England, assignor to Guthrie Industries Limited, London, England

Continuation-in-part of Ser. No. 865,357, Oct. 10, 1969, abandoned. This application Mar. 29, 1972, Ser. No. 239,196

Claims priority, application Great Britain, Oct. 14, 1968, 48678/68

Int. Cl. B08b *3/08*; **B29d** *7/08, 27/04*; **B29f** *3/04*

U.S. Cl. 264—39 **3 Claims**



Layers, either coatings or self-supporting films or sheets, of plastics such as polyurethanes resulting from reactive multicomponent mixes having a very short pot life are produced by extruding the mix through an extrusion die having a slit shaped orifice and internal passageways designed to equalize flow to all points along the length of the orifice. The extrusion die is arranged so that all the surface of the passageways can be exposed for manual cleaning in a very short time interval after extrusion ceases so that the reactive mix can be removed by brushing or scraping from the surfaces before it is fully gelled.

3,832,428
ARTICLES HAVING INTEGRAL TRANSPARENT OR TRANSLUCENT PANELS

James Ernest Ryan, Knebworth, England, assignor to Imperial Chemical Industries Limited, London, England

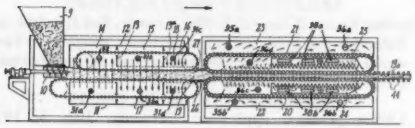
Filed June 8, 1972, Ser. No. 260,728
Int. Cl. B29d *27/03*
U.S. Cl. 264—48 8 Claims

A method for making a shaped article having at least one integral transparent or translucent panel, the method comprising forming a blank of a cellular thermoplastic polymeric material by polymerising the continuous phase of an emulsion having an aqueous disperse phase and a continuous phase comprising one or more polymerisable liquids, then removing the water from the cellular polymeric material so formed over at least the area where the panel is desired; and pressing the blank at a temperature above the softening point of the polymeric material between two dies shaped and positioned to define the desired panel so as to remove the cellular structure of the blank therebetween and form a substantially non-cellular panel.

3,832,429
METHOD AND APPARATUS FOR THE PRODUCTION OF SHEET ON BLOCK OF AGGLOMERATED GRANULES OF POLYSTRYRENE

Maurice Charpentier, Rantigny, France, assignor to Saint-Gobain Idustries, Neuilly sur Seine, France

Filed Apr. 13, 1966, Ser. No. 542,367
Int. Cl. B29c *15/00*; B29d *27/00*
U.S. Cl. 264—51 15 Claims



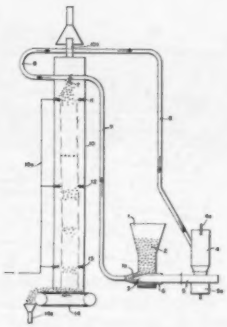
Method and apparatus for the production or agglomerated granules or polystyrene, in sheet or block form. The expanded granules are uniformly heated under relatively slight compression by blowing air through them for a period of between 10 seconds and 3 minutes. The air is preferably at or above the softening temperature of the granules. The heated granules are then compressed under a pressure of from 0.5 to 4 metric tons/m² until their apparent volume is approximately one-half their original volume. The compressed granules are then cooled while remaining under pressure, to a temperature at which the agglomeration does not swell or re-expand. The method can be carried out by batch or by continuous procedures.

3,832,430
METHOD FOR THE EXPRESSION OF EXPANDABLE GRANULES OF THERMOPLASTIC MATERIALS IN PARTICULAR POLYSTYRENE

Jean Noziere, Clermont, Oise, France, assignor to Saint Gobain Industries, Neuilly sur Seine, France

Filed Dec. 11, 1968, Ser. No. 783,038
Claims priority, application France, Dec. 12, 1967, 67.131851
Int. Cl. B29d *27/00*
U.S. Cl. 264—51 7 Claims

Method for the expansion of granules of thermoplastic material, particularly polystyrene. The discrete granules are fed into the upper end of a tower or drum and allowed to descend by gravity while under agitation. While so descending they are insufflated with jets of saturated or superheated steam which surrounds each granule and causes it to expand to a final density as low as 4 kg/m³. The granules may be preheated before insufflation with steam, as by entraining them in a stream of heated air which also deposits them into the top of

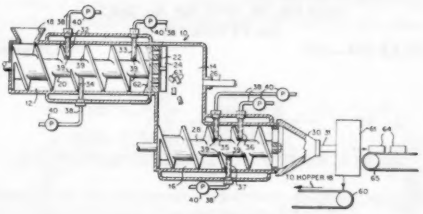


a tower. Or they may be preheated by moving them in a layer between confronting runs of upper and lower foraminous conveyor belts while directing heated air through the layer. When an inclined drum is used the discrete granules are introduced into the elevated end of the rotating drum and agitated while being insufflated with steam dispersed into the drum in a large number of jets distributed in and along its axis of rotation.

3,832,431
PROCESS FOR MAKING MARBLEIZED SOAP OR DETERGENT

Raymond George Matthaei, Fairlawn, N.J., assignor to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 875,091, Nov. 10, 1969, abandoned. This application Feb. 28, 1972, Ser. No. 229,750
Int. Cl. B29b *1/04*; B29f *3/12*
U.S. Cl. 264—75 7 Claims

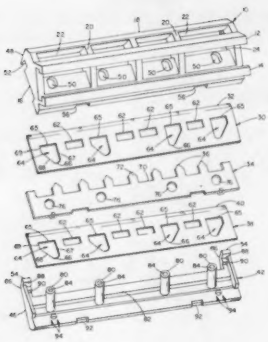


A marbleized mass of soap in the form of a log is produced by passing soap particles through a modified two-stage plodder and injecting a soap additive, e.g., a dye, into the compressed soap mass during extrusion of the soap. The process and apparatus can be used also to produce marbleized detergent logs.

3,832,432
METHOD OF RAZOR BLADE UNIT ASSEMBLY

Roger L. Perry, Lynnfield Center, Mass., assignor to The Gillette Company, Boston, Mass.

Filed June 29, 1972, Ser. No. 267,601
Int. Cl. B23q 3/00; B29c 23/00
U.S. Cl. 264—249 9 Claims

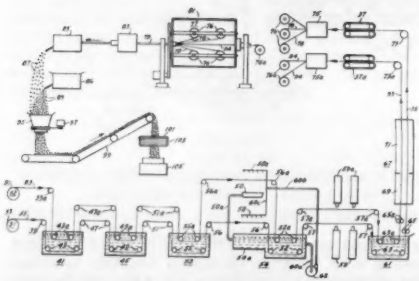


A method of assembling a razor blade unit having two housing components and a blade component is disclosed. The housing components have cooperating housing alignment and blade alignment surfaces. The method includes the steps of securing a first housing component in a predetermined location, depositing the blade component on the first housing component, disposing a second housing component on the blade component, applying a prebiasing force to place the housing alignment surfaces in engagement with one another, then urging the blade component against the blade alignment surfaces while maintaining the prebiasing force on the housing components, and then securing the housing components permanently together to maintain the blade component in the desired aligned relation.

3,832,433
METHOD OF MAKING PLASTIC COMPOSITE WITH WIRE REINFORCEMENTS

Howard E. Schaffer, Allentown, and Craig L. Bomboy, Coopersburg, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Aug. 28, 1972, Ser. No. 284,197
Int. Cl. B02c 18/00
U.S. Cl. 264—143 13 Claims



A wire fiber reinforced plastic composite is formed by coating thin ferrous wires and sacrificial metal wires such as zinc wires in the form of steel and zinc wool or the like with a film of fused acrylonitrile-butadiene-sytrene subsequent to thorough cleaning of the wires. The ferrous and zinc wires are then combined together into a metallic fiber, extrusion coated with a styrene base plastic resin such as polystyrene or acrylonitrile-butadiene-styrene and then chopped into uniform pellets for use as a feed material for a plastic composite hot forming operation preferably heated by induction heating of the component ferrous wires in the plastic. Alternatively the ferrous and zinc fibers can be extrusion coated separately and then blended together as pellets or even used separately for making a plastic composite.

3,832,434
METHOD OF TREATING SILICON DIOXIDE DUST

Hakon Flood, Trondheim, and Arne Seltveit, Moholtan, both of Norway, assignors to Elkem A/S, Oslo, Norway

Filed Oct. 2, 1972, Ser. No. 294,274
Int. Cl. B01j 2/00
U.S. Cl. 264—117 9 Claims

A method of treating colloidal silicon dioxide dust is disclosed. The dust is admixed with water to form a nodulized product thereby reducing the problems normally encountered in connection with transportation and handling of silica-dust.

3,832,435
PROCESS FOR THE MANUFACTURE OF CRIMPED FIBERS AND FILAMENTS OF LINEAR HIGH MOLECULAR WEIGHT POLYMERS

Gunther Bauer, Bobingen; Lothar Kramer, Bad Hersfeld, and Helmut Kuhn, Bobingen, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed June 30, 1971, Ser. No. 158,212
Claims priority, application Germany, July 3, 1970, 2032950
Int. Cl. D01d 5/22
U.S. Cl. 264—168 7 Claims

Fibers and filaments of linear high molecular weight polyesters and copolyesters having a latent three-dimensional crimp are produced by passing the spun filaments after their exit from the spinneret, over a rotating cooled cylinder at a temperature at which they do no longer stick on to the cylinder but are not fully cooled down. The cylinder has a temperature in the range of from 15° to 90°C and rotates at a circumferential speed U of from $V_f/50$ to $V_f-V_f/90$, V_f being

the draw off speed of the filaments. The filaments are in contact with a surface section of the cylinder the length of which is determined by a contact angle of 10° to 150°.

3,832,436

PROCESS FOR SPINNING HIGH TENACITY FIBRES

Eric Frank Harris, Greenisland, Northern Ireland, and John Francis Lloyd Roberts, Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 30, 1973, Ser. No. 346,490

Claims priority, application Great Britain, Apr. 6, 1972, 15848/72

Int. Cl. D01f 3/10

U.S. Cl. 214—210 F 5 Claims

Poly(ethylene-1:2-diphenoxyethane-4:4′-dicarboxylate) extruded to give spun yarn birefringence above 60×10^{-3} and not above value by equation $\Delta = 18 \times 10^{-6} W + 50 \times 10^{-3}$ where Δ is spun yarn birefringence and W is wind up speed, followed by orientation by extension.

3,832,437

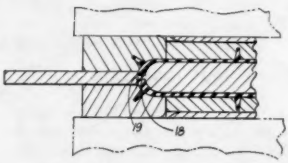
METHOD FOR FORMING HOLLOW ARTICLES

Don A. Taylor, P.O. Box 4, Wadsworth, Ohio 44281

Filed May 17, 1971, Ser. No. 143,919

Int. Cl. B29h 5/14

U.S. Cl. 264—248 3 Claims



Thermally curable material, such as rubber or plastic, is heated and molded under pressure about a mandrel in a split compression mold to form initially a partially cured hollow article with an opening therein through which the mandrel may be withdrawn with little or no elastic deformation or distortion of the article. The opening is defined by aligned molded edges that are spaced apart, but can be pressed together by segmental portions of the mold to close the opening after the mandrel is removed. The initial partial curing is to a degree such that the material can hold its shape in the mold and the edges can fuse and bond together if placed under pressure contact with each other. After the initial curing the mold closing pressure is relieved, the segmental portions of the mold are opened, and the mandrel is withdrawn from the article through the opening and from the mold. Closing pressure is immediately reapplied and the segmental mold portions are operated to force the aligned edges into contact under sufficient pressure to cause them to fuse and bond together in sealing relation. Heating in continued with the mold in this latter operating condition until the material is fully cured. The mold is then opened and the article stripped therefrom. A specialized mold and mandrel are used for forming the aligned edges and for pressing these edges together. Concavities in the cavity wall receive some of the molded material which temporarily hold the article walls in firm contact with the cavity walls during withdrawal of the mandrel. The material in the concavities is stripped free therefrom readily upon stripping the cured article from the mold.

3,832,438

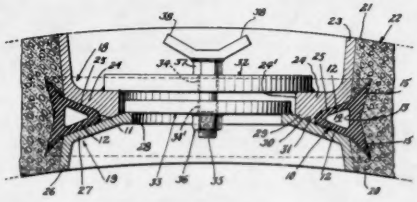
METHOD OF PROVIDING A GASKET SEAL BETWEEN SEWER PIPE AND MANHOLE OPENING

John Ditcher, Langhorne, Pa., assignor to A-LOK Corporation, Trenton, N.J.

Division of Ser. No. 127,520, March 24, 1971. This application Sept. 26, 1972, Ser. No. 292,342

Int. Cl. B29f 1/10

U.S. Cl. 264—274 3 Claims



Providing a leakproof seal between the surface of an opening through the wall of a manhole and the outer surface of a pipe which passes through that opening. An extruded gasket strip, of elastomeric material and of A section, is rooted, by the splayed legs of the A, in the concrete of the manhole wall around said opening. The upper portion of the A yieldingly spans the distance between the surface of the opening and the surface of the pipe. A shaping element is provided to define the shape and character of the surface of the opening and to securely hold the gasket strip while the concrete is being poured to form the manhole wall, and until it has set.

3,832,439

METHOD FOR THE SUPPRESSION OF HYDROGEN DURING THE DISSOLUTION OF ZIRCONIUM AND ZIRCONIUM ALLOYS

Daniel G. Carter, Jr., Richland, Wash., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Jan. 10, 1973, Ser. No. 322,565

Int. Cl. C01g 56/00

U.S. Cl. 423—4 4 Claims

The evolution of hydrogen during dissolution of zirconium and zirconium alloys in an ammonium fluoride and ammonium nitrate solution (Zirflex Process) is suppressed by the presence of copper in the solution, while the rate at which the zirconium is dissolved is improved by the addition of sodium nitrite.

3,832,440

PROCESS FOR CHLORINATING COPPER SULFIDE MINERALS

Bernhard W. Spreckelmeyer, Porz-Urbach, Germany, assignor to Kennecott Copper Corporation, New York, N.Y.

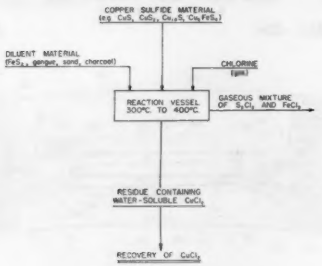
Filed Apr. 7, 1971, Ser. No. 131,947

Int. Cl. C01g 3/04, 49/10; C01b 17/45

U.S. Cl. 423—40 3 Claims

A substantially dry intimate mixture of copper sulfide mineral concentrate and an added diluent material is contacted with at least a stoichiometric amount of chlorine relative to chlorinatable compounds of such materials at a temperature of between 300° and 400° C. to produce a reaction product containing water-soluble cupric chloride. Sulfur and iron values present in the mixture are substantially completely

volatilized. Typical diluent materials are chlorinatable iron compounds, gangue materials, silica sand, and carbon. A portion of the diluent can be already present in the copper sulfide material, for example gangue components of a copper sulfide mineral concentrate, with the rest of the necessary diluent



being added to form the mixture. The cupric chloride product recovered from the water-insoluble residue in the reaction product as by means of water leaching is substantially uncontaminated by sulfur or iron values.

3,832,441

METHOD OF MANUFACTURING ZIRCONIUM OXIDE AND SALTS

Robert A. Schoenlaub, 4141 Chadbourne Dr., Columbus, Ohio 43220

Filed July 16, 1973, Ser. No. 379,370
Int. Cl. C01g *25/00*
U.S. Cl. 423—71 **4 Claims**

A process for the production of calcium zirconate and zirconium oxide or salts therefrom which is characterized by reacting the mineral zircon with limestone to form calcium zirconate and tricalcium silicate. The calcium zirconate is freed from the tricalcium silicate by simple thermal steps which transform the tricalcium silicate to a form which can be separated by physical means. After light milling, the calcium zirconate can be recovered from the gangue material by mineral dressing techniques. The relatively pure form of zirconate can then be treated with acids to form zirconium sulphate which in turn is treated with well-known reagents to form zirconium oxide or other zirconium compounds.

3,832,442

METHOD FOR PRODUCING ALUMINA HYDRATES

Robert B. Emerson, Baton Rouge, La., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Oct. 20, 1970, Ser. No. 82,486
Int. Cl. C01f *7/02*; **B01d** *15/00*; **B01j** *1/22*
U.S. Cl. 423—111 **8 Claims**

Alumina hydrates of improved purity and enhanced whiteness are recovered from impure alkali aluminate liquor by contacting the liquor with an active alumina to remove by sorption undesired color bodies and metallic impurities.

3,832,443

EXHAUST GAS CONVERSION PROCESS

Robert H. Hass, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 26, 1971, Ser. No. 175,115
Int. Cl. B01d *53/00*
U.S. Cl. 423—213.7 **10 Claims**

A process is disclosed for the catalytic conversion of nitrogen oxides, unburned hydrocarbons and carbon monoxide in exhaust gases initially containing less than a stoichiometric ratio of oxygen to carbon monoxide. The basic novel feature of the process involves gradually increasing the oxygen concentration of the gases downstreamwardly in the conversion zone, in such manner as to maintain a generally increasing O_2/CO mole-ratio in that section of the conversion zone (the initial section) in which the ratio of O_2/CO is less than stoichiometric. In the latter part of the conversion zone, the ratio of O_2/CO is greater than stoichiometric.

3,832,444

RECOVERY OF SO_2 AND SO_3 FROM FLUE GASES

William L. Doyle, Hermosa Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 62,313, Aug. 10, 1972, abandoned. This application May 18, 1972, Ser. No. 254,812
Int. Cl. C01b *17/00, 17/45*
U.S. Cl. 423—242 **3 Claims**

SO_2 and SO_3 are recovered from flue gas by absorption in a saline solution of sodium carbonate or sodium hydroxide maintained at a high pH. Na_2SO_3 is precipitated and may be easily removed, while the SO_2 concentration is reduced to about 1 percent of the original content in the flue gas.

3,832,445

SULFUR DIOXIDE REMOVAL

Herman W. Kouwenhoven; Franciscus W. Pijpers, and Nicolaas Van Lookeren Campagne, all of Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.

Continuation-in-part of Ser. No. 106,270, Jan. 13, 1971, abandoned, which is a continuation of Ser. No. 487,040, Sept. 13, 1965, abandoned. This application May 7, 1971, Ser. No. 141,421
Claims priority, application Netherlands, Sept. 14, 1964, 6410671
Int. Cl. C01b *17/00*
U.S. Cl. 423—244 **12 Claims**

Removing sulfur dioxide from an SO_2 and oxygen-containing gas by contacting the gas with a solid acceptor for SO_2 comprising supported cupric oxide at a temperature between 300 and 500°C and regenerating the solid acceptor by use of a reducing gas at temperatures within the same range as the acceptance temperature.

3,832,446

SALT CRYSTAL CONGLOMERATES

Richard R. Mitchell, Factoryville, Pa., and Robert van den Bor, Hengelo, Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Sept. 27, 1971, Ser. No. 184,198
Int. Cl. C01b ; C01c ; C01d ; C01f
U.S. Cl. 423—267 **10 Claims**

The disclosed invention relates to a compacted conglomeration of salt crystals treated with a solution containing complex iron cyanide ions.

3,832,447

METHOD FOR PRODUCING SODIUM PERBORATE TRIHYDRATE

Helmut Dillenburg, Bad Honningen; Helmut Honig, Sehnde, and Rudolf Siegel, Niederbieber, all of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

Filed Oct. 12, 1971, Ser. No. 188,623
Claims priority, application Germany, Oct. 16, 1970, 2050883
Int. Cl. C01b *15/12*
U.S. Cl. 423—281 **5 Claims**

A method for producing sodium perborate trihydrate, including mixing, at a temperature above 25°C, hydrogen perox-

ide with a sodium metaborate solution in the presence of seed crystals of sodium perborate trihydrate and means for reducing the solubility of sodium perborate, and maintaining a $NaBO_2$ to H_2O_2 ratio in the resulting mixture in the range 1:0.4 to 1:0.7.

3,832,448

PROCESS FOR PRODUCTION OF PHOSPHORUS

James Edgar Longfield, Stamford, and Daniel Hyman, Greenwich, both of Conn.

Filed Oct. 29, 1969, Ser. No. 872,004
Int. Cl. C01b *25/02, 25/04*
U.S. Cl. 423—322 16 Claims

Phosphorus is produced by reduction of phosphate ores with hydrocarbon gas in a stream comprising finely divided phosphate solids dispersed as a dilute solid phase in a gas stream which contains the hydrocarbon reactant. Extremely high reaction temperature is attained by heating the reactants with a gas plasma.

3,832,449

CRYSTALLINE ZEOLITE ZSM–12

Edward J. Rosinski, Deptford, N.J., and Mae K. Rubin, Bala Cynwyd, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 18, 1971, Ser. No. 125,749
Int. Cl. C01b *33/28*
U.S. Cl. 423—328 8 Claims

A crystalline zeolite designated ZSM–12 having the following composition expressed as mole ratios of oxides:

$1.0 \pm 0.4\ M_{2/n}O \cdot W_2O \cdot 20\text{–}100\ YO_2 \cdot ZH_2O$

where M is at least one cation and *n* is the valence thereof, W is aluminum or gallium, Y is silicon or germanium, and Z is a value ranging from 0 to 60. In a preferred synthesized form, M is a mixture of alkali metal cations, especially sodium, and tetraalkylammonium cations. These zeolites are characterized by a specified X-ray powder diffraction pattern. Catalytically active forms of said zeolites are used in a wide variety of hydrocarbon conversion reactions.

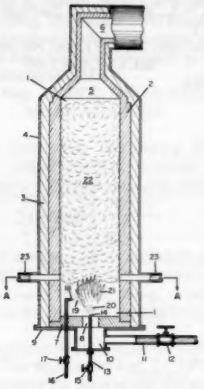
3,832,450

CARBON BLACK PROCESS

Louis E. Wiggins, West Monroe, La., assignor to Cities Service Company, New York, N.Y.

Filed Dec. 18, 1972, Ser. No. 316,200
Int. Cl. C01b *31/02*; C09c *1/50, 1/48*
U.S. Cl. 423—450 13 Claims

An oil furnace black process wherein a stream of liquid water intersects a liquid stream of feedstock hydrocarbon after streams of both liquids have been injected into a heated carbon black furnace. When the water stream contacts the liquid feedstock stream it is relatively cold in comparison to the temperature of the feedstock. Exothermic reaction of the feedstock with free oxygen present in the furnace is caused by contact with the water, and is characterized by a visible blazing and a substantial increase in temperature beyond the point at which the feedstock and the water are mixed. In the present invention the injection of water into the furnace thus serves a new and different purpose, i.e., in prior processes water has been injected to quench the temperature of a carbon black aerosol within the furnace or beyond it, and the water has thus been injected after formation of the carbon black had been at least substantially completed. In the present case water is injected into the feedstock hydrocarbon at a very early stage after it enters the furnace and instead of a quenching, the injection of water causes a flaming reaction of the feedstock with oxygen and thus promotes the formation of carbon black.



The resulting carbon black products are characterized by an elevated iodine adsorption and/or an unusually high electrical conductivity.

3,832,451

METHOD OF MAKING MICROCRYSTALLINE FLUORIDE FIBERS

Edwin F. Abrams, Silver Spring, Md., and Robert G. Shaver, Fairfax, Va., assignors to General Technologies Corporation, Springfield, Va.

Filed Mar. 26, 1973, Ser. No. 344,884
Int. Cl. C01b *9/08*; C01f *11/22*; C01g *53/08*
U.S. Cl. 423—489 5 Claims

A process for producing metal fluoride fibers by impregnating organic precursor fibers with a soluble metal salt, precipitating insoluble fluoride of the metal within the precursor fibers by introducing a second solution comprising a fluoride which when reacted with said first salt will yield said insoluble metal fluoride plus another second salt which can be subsequently removed from the precursor fiber without removing said metal fluoride, the second salt thus produced being either soluble so that it can be removed by washing, or else being capable of gassification at temperatures low enough to avoid degradation of the desired metal fluoride, and the organic precursor then being degraded and driven off by a carefully controlled sintering operation.

3,832,452

PURIFICATION OF ANHYDROUS ALUMINUM CHLORIDE IN SITU IN A SALT MELT

Dell A. Crouch, Jr., Village of Pennbrook, Levittown, Pa. 19053

Filed Apr. 10, 1973, Ser. No. 349,779
Int. Cl. H01m *11/00*; H01m *9/00*
U.S. Cl. 423—495 6 Claims

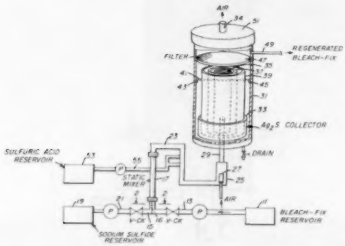
Purification of anhydrous aluminum chloride in an alkaline metal chloride-aluminum chloride melt can be effected in situ by the addition of solid alkali metal to the melt.

3,832,453

RECOVERY OF SILVER FROM PHOTOGRAPHIC PROCESSING SOLUTIONS

Idalee Slovonsky; Thomas J. Dagon, and Thomas W. Bober, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 23, 1971, Ser. No. 201,274
Int. Cl. C01g 5/00
U.S. Cl. 423—561 5 Claims



Silver is recovered from an exhausted photographic fix or bleach-fix solution by bringing together just at the entrance of a static mixer a stream of a sodium sulfide solution and a stream of fix or bleach-fix solution, and passing the mixture at high velocity through the static mixer, wherein it is repeatedly divided and changed in flow pattern, to precipitate silver sulfide particles. The flowing mixture containing silver sulfide particles is then passed into a separation chamber of enlarged cross section, and its flow is slowed and reversed by baffles to cause the silver sulfide particles to drop out and collect in the bottom. A fix solution is regenerated for reuse by the above procedure. When a bleach-fix is treated, it can be regenerated by introducing air, either upstream or downstream of the separation chamber, to reoxidize to ferric ions any ferrous ions present as a result of the bleaching operation, or those ferrous ions produced by reaction of sodium sulfate with residual ferric ions in the exhausted bleach-fix. A small amount of acid also should be added to adjust the pH to below 7.

3,832,454

PROCESS FOR MANUFACTURING SULFUR FROM A GAS CONTAINING HYDROGEN SULFIDE AND SULFUR DIOXIDE

Phillippe Renault, Noisy-le-Roi; Andre Deschamps, Chatou, and Claude Dezael, Maisons-Laffitte, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil-Malmaison, France

Filed Jan. 11, 1972, Ser. No. 216,988
Claims priority, application France, Jan. 19, 1971, 71.01717; Mar. 24, 1971, 71.18746
Int. Cl. C01b 17/04
U.S. Cl. 423—574 24 Claims

Sulfur is manufactured from hydrogen sulfide and sulfur dioxide at a temperature of from 100° to 180°C in a reaction medium comprising ammonia and an organic solvent containing an alkali metal salt of a weak acid. The outflow from the reaction zone may be cooled down and washed in two steps and the condensates may be recycled to the reaction zone. The process is particularly useful for controlling atmospheric pollution.

3,832,455

PREPARATION OF ZINC FERRITE YELLOW PIGMENTS

George B. Smith, Sycamore, and Kent A. Orlandini, West Chicago, both of Ill., assignors to George B. Smith Laboratories, Sycamore, Ill.

Filed Oct. 25, 1972, Ser. No. 300,847
Int. Cl. C01g 49/00
U.S. Cl. 423—594 18 Claims

Preparation of so-called "tans" pigments, in the form of certain zinc ferrites of substantially nonmagnetic character, by, for example, aerating a mixture of an aqueous solution of ferrous sulfate with zinc oxide at a controlled pH and at somewhat elevated temperature, adding an alkali whereby to precipitate out hydrous ferric and zinc oxides, heating to effect coupling of said hydrous oxides, washing to effect removal of substantially all water-soluble salts which may be present, and then calcining at elevated temperatures.

3,832,456

PROCESS FOR THE MANUFACTURE OF BERYLLIUM HYDRIDE

Paul Kobetz, Baton Rouge; Roy J. Laran, Greenwell Springs, both of La., and Robert W. Johnson, Jr., Savannah, Ga., assignors to Ethyl Corporation, New York, N.Y.

Filed Oct. 18, 1962, Ser. No. 232,662
Int. Cl. C01b 6/00
U.S. Cl. 423—645 18 Claims

1. A process for the preparation of beryllium hydride which comprises reacting (1) a dialkyl aluminum hydride whereof each alkyl group contains not more than about eight carbon atoms, said dialkyl aluminum hydride containing more than 30 mole percent of a trialkyl aluminum, with (2) a compound selected from the group consisting of (a) beryllium halides in which the halogen has an atomic number from 17 to 53, (b) beryllium halide etherates of the general formula

$$BeX_2 nR'_2O$$

wherein X is halogen of atomic number from 17 to 53, n is 1 to 2, inclusive, and R' is an alkyl radical containing from one to eight carbon atoms, and (c) beryllium alkoxides of the general formula

$$Be(OR')_2$$

the reaction mixture containing at least one mole of R'_2O per mole of trialkyl aluminum in the alkyl aluminum hydride-trialkyl aluminum mixture present in the reaction mixture and recovering beryllium hydride from the reaction product.

3,832,457

FERRITE CONTRAST MEDIA WITH METALLIC OXIDES

Mitsuo Sugimoto; Koemon Funaki, and Yuzo Saeki, all of Tokyo, Japan, assignors to Rikagaku Kenkyusho, Kitaodachi-gun, Saitama-ken, Japan

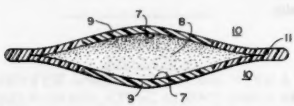
Filed June 17, 1970, Ser. No. 46,913
Claims priority, application Japan, June 20, 1969, 44-48724; June 20, 1969, 44-48725; Nov. 15, 1969, 44-91718; May 13, 1970, 45-40656
Int. Cl. A61k 27/08
U.S. Cl. 424—4 3 Claims

Contrast media for radiography of organs comprises a sufficient amount of fine solid particles of at least one kind of soft magnetic ferrites suspended in a liquid carrier, wherein said carrier contains at least one kind of additive agents selected from the group consisting of organic thickening compounds such as starch, sodium alginate and polyvinyl alcohol, fine powder of metallic oxides selected from Ba, Bi, Ce, W, Zr, Sn, Ta, Vb, La, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho and Y.

3,832,458
HYDROPHILIC SILICONE COMPOSITION AND METHOD

Edward W. Merrill, Cambridge, Mass., assignor to Trustees of the Charles River Foundation, Boston, Mass.

Filed Dec. 6, 1971, Ser. No. 205,156
Int. Cl. A61k 27/12; A61m 7/00
U.S. Cl. 424—19 26 Claims



A water permeable composition comprising a copolymer of a polysiloxane and N-vinyl pyrrolidone wherein the N-vinyl pyrrolidone is distributed through the thickness of the composition. The composition is useful for forming capsules containing a water soluble drug which can be implanted in an animal to distribute the drug thereto.

3,832,459
SPRAY DISINFECTANT-DEODORANT

Bernard Berkeley, Evanston, Ill., assignor to Hysan Corporation, Chicago, Ill.

Filed Mar. 18, 1971, Ser. No. 125,876
Int. Cl. A61l 9/00
U.S. Cl. 424—45 11 Claims

A three-phase aerosol spray disinfectant-deodorant combining the simultaneous use of a complexing polymer which has a detoxifying effect with respect to a phenolic-type germicidal agent and a surface anesthetic which desensitizes the mucous membrane when the spray composition is either inhaled or deposited on the skin.

3,832,460
ANESTHETIC-VASOCONSTRICTOR-ANTIHISTAMINE COMPOSITION FOR THE TREATMENT OF HYPERTROPHIED ORAL TISSUE

Carl M. Kosti, 704 Foxhall Rd., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 829,793, July 2, 1969, Pat. No. 3,574,859, which is a continuation-in-part of Ser. No. 742,535, July 5, 1968, abandoned. This application Mar. 19, 1971, Ser. No. 126,256
U.S. Cl. 424—54 9 Claims

A composition for the treatment of hypertrophied and hyperplastic oral tissue and the pain phenomena associated with this condition. The composition contains as essential ingredients thereof one or more alkaloids, such as the sympathomimetic amines, which are vasoconstrictors and effect vasoconstriction of the oral tissue, an antihistaminic agent which interfers with the access of histamine to the endothelial cells of the capillary membrane, and a topical anesthetic to relieve pain.

3,832,461
METHOD FOR DISRUPTING PHEROMONE COMMUNICATION WITH CIS-7-DODECENI-1-OL

James H. Tumlinson, III; Everett R. Mitchell; Stella M. Browner; Marion S. Mayer, all of Gainesville, Fla.; Nathan Green, Silver Spring, Md.; Ronald W. Hines, Alachua, Fla., and Donald A. Lindquist, Vienna, Austria, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 15, 1972, Ser. No. 235,029
Int. Cl. A01n 17/14
U.S. Cl. 424—84 1 Claim

A method for controlling the mating behavior of the cabbage looper which method consists of disrupting pheromone communication with a specific inhibitor.

3,832,462
ANTIBIOTIC AV290-SYNTAN COMPLEXES AND ANIMAL FEED SUPPLEMENTS

Ping Shu, Pomona, and Murray Dann, Pearl River, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 86,601, Nov. 3, 1970, abandoned. This application Apr. 11, 1972, Ser. No. 243,093The portion of the term of this patent subsequent to June 25, 1991, has been disclaimed.
Int. Cl. A61k 21/00
U.S. Cl. 424—123 5 Claims

This disclosure describes a reversible complex of antibiotic AV290 with a synthetic tanning agent and a process for preparing same. The complex is useful as an animal feed supplement which significantly enhances the growth rate of animals and poultry.

3,832,463
WOOD-TREATMENT COMPOSITIONS CONTAINING HEXAVALENT CHROMIUM

James Nicholson, Pontefract, England, assignor to Hickson's Timber Impregnation Co. (G.B.) Limited, Castleford, Yorkshire, England

Continuation of Ser. No. 68,484, Aug. 31, 1970, abandoned, which is a continuation-in-part of Ser. No. 583,089, Sept. 29, 1966, abandoned. This application June 2, 1972, Ser. No. 259,107
Claims priority, application Great Britain, Oct. 6, 1965, 42421/65
Int. Cl. A01n 11/00
U.S. Cl. 424—131 7 Claims

There are provided wax solutions self-dispersible in waterborne wood preservatives containing hexavalent chromium to form stable emulsions. There is also provided a method of preserving wood wherein wood is impregnated with said emulsions. The solutions comprise a hydrocarbon solvent having dissolved therein from 5 to 25 percent by weight of a hydrophobic wax and at least 4 percent by weight of a nonionic surface active agent having an HLB value between 7 and 11, the surface active agent being a condensate of a long chain fatty alcohol or an alkyl phenol with ethylene oxide.

3,832,464
PESTICIDAL COMPOSITIONS CONTAINING PHOSPHORIC ACID ESTERS AND ELEMENTAL SULPHUR

Claude Hennart, Aubervilliers, France, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Sept. 13, 1971, Ser. No. 180,135
Claims priority, application France, Sept. 11, 1970, 70.33012
Int. Cl. A01n 11/06, 9/36
U.S. Cl. 424—175 5 Claims

Pesticidal composition comprising stabilised pesticidal phosphoric esters containing as stabilising agent for said esters

0.05 to 6 percent of a compound chosen between the know varieties of elemental sulphur.

Process to stabilise pesticidal phosphoric esters according to which 0.05 to 6 percent of a compound chosen among the known varieties of elemental sulphur is added to the composition containing the phosphoric ester.

3,832,465

INJECTABLE AMINO ACID COMPOSITION COMMENSURATE TO THE ANABOLIC NEED OF THE BODY AND METHOD OF USING SAME

Hossein Ghadimi, 3612 Berthu Dr., Baldwin, N.Y. 11510

Continuation-in-part of Ser. No. 206,536, Dec. 9, 1971, abandoned. This application Aug. 17, 1972, Ser. No. 281,317

Int. Cl. A61k *27/00*

U.S. Cl. 424—177 11 Claims

Novel amino acid compositions suitable for intravenous alimentation are provided. They are composed by taking into account the fact that in intravenous alimentation, unlike ingestion, the administered amino acids do not pass through the liver before reaching other parts of the body. The compositions are ammonia-free, do not contain heretofore unidentified peptides and other impurities derived on protein hydrolysis, but contain cysteine, reduced amounts of methionine and increased amounts of branched-chain amino acids. They are tailored to the needs of the body at different ages and can be adapted to any desired requirement. Administered in recommended dosage the plasma-free amino acid content and proportion of the peripheral blood will remain within normal range.

3,832,466

3-AZOLYLPROPYNE FUNGICIDAL AGENTS

Gerhard Jager; Karl Heinz Buchel, both of Wuppertal-Elberfeld; Ferdinand Grewe, Burscheid, and Paul-Ernst Frohberger, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

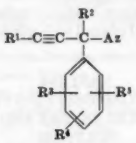
Filed May 26, 1972, Ser. No. 257,365

Claims priority, application Germany, June 9, 1971, 2128700

Int. Cl. A01n *9/22*

U.S. Cl. 424—273 9 Claims

Fungicidal and bactericidal compositions comprising, and methods of combating fungi and bacteria using 3-azolylpropynes of the general formula



(I)

in which

R^1 is hydrogen, chlorine, bromine, iodine, alkyl, an optionally substituted aryl, aryloxyalkyl, arylthioalkyl, arylaminoalkyl or arylalkylaminoalkyl group, alkoxyalkyl, alkylmercaptoalkyl, alkylaminoalkyl, or dialkylaminoalkyl wherein the two alkyl radicals of the dialkylamino moiety may form, with the amine nitrogen atom, a five-membered to seven-membered ring that may contain at least one further hetero-atom or hetero-group,

R^2 is alkyl, optionally substituted cycloalkyl or optionally substituted aryl,

R^3, R^4 and R^5 each independently is hydrogen, alkyl, alkoxy, alkylmercapto or an electronegative substituent, and

Az represents an optionally substituted five-membered heterocyclic radical containing one or more nitrogen atoms,

or their salts.

3,832,467

INSECTICIDAL CHRYSANTHEMATE COMPOSITIONS AND THEIR METHOD OF USE

Michio Nakanishi, and Toshihiko Mukai, both of Oita, Japan, assignors to Sumitomo Chemical Company, Limited, Higashi-ku, Osaka, Japan

Division of Ser. No. 750,776, Aug. 7, 1968, Pat. No. 3,702,333. This application Sept. 7, 1972, Ser. No. 287,023

Claims priority, application Japan, Aug. 11, 1967, 42-51511; Mar. 5, 1968, 43-14200

Int. Cl. A01n *9/28*

U.S. Cl. 424—285 2 Claims

2-methyl-5-(2-propynyl)-3-furylmethyl 2,2,3,3-tetramethylcyclopropanecarboxylate and 2-methyl-5-(2-propynyl)-3-furylmethyl chrysanthemate are used to control insects.

3,832,468

USE OF CERTAIN SMECTITE CLAYS TO EXTEND RESIDUAL ACTIVITY OF PARTICULAR HYDROXAMATES

Archibald M. Hyson, Newark, and John K. Scoggin, Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 45,229, June 10, 1970, abandoned. This application May 14, 1971, Ser. No. 143,682

Int. Cl. A01n *9/12*, *9/20*

U.S. Cl. 424—298 8 Claims

Pesticidal formulations of methyl O-(methyl-carbamyl)thiolacetohydroxamate and methyl O-carbamyl thiolacetohydroxamate with adsorptive uncalcined smectite-containing clays having extended residual activity, and formulations of methyl O-(methylcarbamyl)thiolaceto-hydroxamate and adsorptive uncalcined smectite-containing clays having reduced phytotoxicity on pesticide-sensitive crops such as cotton, corn and other leafy vegetables.

3,832,469

ESTRUS AND OVULATION REGULATION

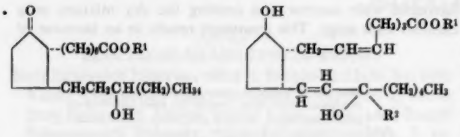
Bruce R. Downey, Morrisonville, N.Y., and Douglas S. Irvine, Terrebonne, Quebec, Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,687

Int. Cl. A61k *27/00*

U.S. Cl. 424—318 6 Claims

A method is disclosed whereby estrus is induced and ovulation is regulated in domestic animals by administering a prostaglandin derivative of formula 1*a* or 1*b*,



in which R^1 and R^2 each are hydrogen or lower alkyl, to the animal during the functional life of a corpus luteum of said animal.

3,832,470

TREATMENT OF ANGINA PECTORIS WITH A LONG-ACTING VASODILATING AGENT AND A BETA ADRENERGIC RECEPTOR BLOCKING AGENT

Henry Irving Russek, 176 Hart Blvd., Staten Island, N.Y. 10301

Continuation of Ser. No. 701,079, Jan. 29, 1968. This application Oct. 6, 1969, Ser. No. 866,098
Int. Cl. A61k 27/00
U.S. Cl. 424—330 1 Claim

A pharmacologic preparation is disclosed for the treatment of angina pectoris consisting of a mixture of a long-acting vasodilating agent such as pentaerythritol tetranitrate, erythrityl tetranitrate or isosorbide dinitrate and a beta adrenergic receptor blocking agent such as 1-(3,4-dichlorophenyl)-2-isopropylamino-1-ethanol, 1-(3,4-dihydrophenyl-2-isopropylamino-1-ethanol, 1-(2,5-dimethoxyphenyl)-2-methyl-2-t-butylamino-1-ethanol, 1-3,4-dichlorophenyl)-2-methyl-2-isopropylamino-1-ethanol, 1-(4-methanesulphonylaminophenyl)-2-isopropylamino-1-ethanol, 1-(3-tolyloxy)-3-isopropylamino-2-propanol, 1-(5,6,7,8-tetrahydronaphth-2-yl)-2-s-butylamino-1-ethanol, 1-(2-allylphenoxy)-3-isopropylamino-2-propanol, 1-(p-nitrophenyl)-2-isopropylamino-1-ethanol, 1-(p-nitrophenyl)-2-n-butylamino-1-ethanol or 1-(isopropylamino)-3-(1-naphthyloxy)-2-propanol hydrochloride. The vasodilating agent and the beta blocking agent can be administered together or separately at short intervals such that the therapeutic actions of the two drugs overlap.

3,832,471

METHOD OF FEEDING CATS THAWED FROZEN FISH FLAVORED WITH 5'-NUCLEOTIDES

John A. Siregar, Allentown, Pa., assignor to Liggett & Myers Incorporated, New York, N.Y.

Filed Aug. 24, 1972, Ser. No. 283,372
Int. Cl. A23b 3/06; A23k 1/10
U.S. Cl. 426—2 4 Claims

A prepared food product containing thawed frozen fish and as an additive thereto, at least one 5'-nucleotide or salt thereof in proportion at least sufficient to improve the flavor of the thawed frozen fish.

3,832,472

WHEAT PRODUCT

Nelson E. Rodgers, Wayzata, and Jack R. Durst, Osseo, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Mar. 17, 1972, Ser. No. 235,700
Int. Cl. A23c 1/10
U.S. Cl. 426—148 14 Claims

This wheat product comprises endosperm in which the cellular structure is completely disrupted and dispersed. The starch granules are free and unassociated with gluten protein particles. The granules are intact, ungelatinized and retain the native anisotropic structure. The gluten protein is metamorphosed to smoothly contoured particles containing very little starch and is substantially undenatured with respect to doughing function. Depending on intended use, the germ and aleurone fractions of the wheat grain can be excluded or included in the product. The product can be used as an aqueous dispersion or in a dried form.

3,832,473

MAINTENANCE OF FLAVOR INTEGRITY IN PRESSED MINT ASSORTMENTS

Miroslaw Sahaydak, Great Neck, N.Y., assignor to Warner-Lambert Company, Morris Plaines, N.J.

Filed Mar. 8, 1972, Ser. No. 232,955
Int. Cl. A23l 1/26; A23g 3/00
U.S. Cl. 426—175 7 Claims

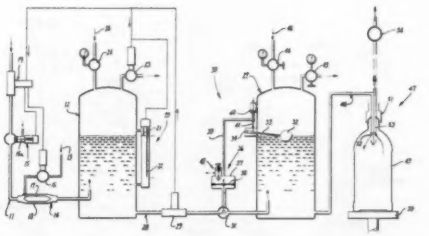
Flavor integrity in an assortment of pressed mints packaged with different flavors adjacent to one another in a unitary package, is maintained by utilizing a solid particulate emulsion form of the flavor oil. The flavor oil is emulsified in a mixture of corn syrup solids, an emulsifier, and either glycerol, a nontoxic glycol or mixtures thereof; the molten mixture obtained is extruded into a cold fluid to obtain a solidified filament which is broken into small particles. From 1 percent to 10 percent, preferably from 2.25 percent to 9 percent by weight, based on the total weight of the formulation, of a differently flavored emulsion is incorporated into each pressed mint. A preferred assortment contains, in a unitary package, pressed mints flavored with a solid particulate emulsion of orange oil, lemon oil, lime oil, cherry essence (imitation), oil of wintergreen, pineapple essence (imitation), grapefruit oil and peppermint oil, each mint in the assortment being flavored with one of the aforementioned flavors.

3,832,474

CARBONATED BEVERAGE SYSTEM

Fred A. Karr, Redwood City, Calif., assignor to Shasta Beverages Division of Consolidated Food Corporation, Hayward, Calif.

Filed June 19, 1972, Ser. No. 264,343
Int. Cl. C02d 1/02
U.S. Cl. 426—477 2 Claims



A system for continuously preparing a carbonated product and filling containers. Carbon dioxide is applied to a liquid under carbonating pressure and the carbonated liquid is

passed to a stabilizing tank maintained at a pressure at least equal to carbonating pressure. Thereafter, the liquid is directed to a pressure reduction tank in which the pressure is lowered to a level just sufficient to produce the desired flow rate to the filler. By reducing the pressure prior to filling, a filler of the gravity or vacuum type may be employed without excessive foaming. Or, if a counter pressure filler is employed, operating pressure is considerably lowered.

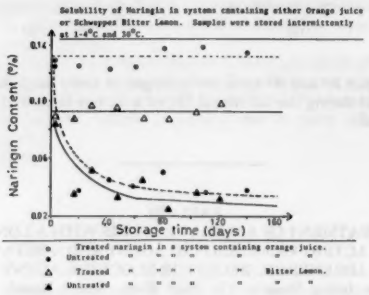
3,832,475

PREVENTION OF CRYSTALLIZATION OF SPARINGLY SOLUBLE FLAVONOIDS IN FOOD SYSTEMS

Amnon Dov Zirlin, Haifa, Israel, assignor to Centre for Industrial Research (CIR) Ltd., Haifa, Israel

Filed Sept. 7, 1972, Ser. No. 286,987
Claims priority, application Israel, Oct. 22, 1971, 37995
Int. Cl. A23l 1/00
U.S. Cl. 426—365 **6 Claims**

A method for prevention of crystallization of sparingly soluble flavonoids in acidic soft drinks is described. The method consists in the preparation of a uniform dry mixture of the flavonoid with sucrose and heating the dry mixture to a caramel melt stage. This treatment results in an increase of four fold of the flavonoid solubility in acidic soft drinks, without substantial change in the organoleptic property of the flavonoid.

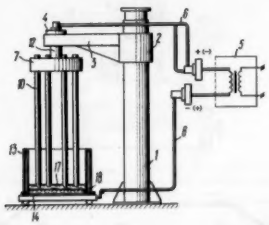

Solubility of Naringin in systems containing either Orange juice or Schweppes Bitter Lemon. Samples were stored intermittently at 1-4°C and 26°C.
Naringin Content (%)
0.14
0.10
0.06
0.02
0
40
80
120
160
Storage time (days)
Treated naringin in a system containing orange juice.
Untreated " " " " " " "
Treated " " " " Bitter Lemon.
Untreated " " " " " " "

ELECTRICAL

3,832,476
ELECTROSLAG MELTING OF INGOTS

Boris Izrailevich Medovar, ulitsa A. Barbju-sa, 22/26, kv. 109; Valery Evgenievich Lanevsky, ulitsa V. Kuchera 2, kv. 8; Jury Fedorovich Alferov, bulvar Lepse, 29, kv. 64; Rudolf Solomonovich Dubinsky, ulitsa Politekhnicheskaya, 5, kv. 209; Mikhail Elevich Berezovsky, ulitsa Lomonosova, 21/14, kv. 54; Leonty Vasilievich Chekotilo, ulitsa A. Barbjusa 22/26, kv. 64; Leonid Viktorovich Pavlov, ulitsa Borschagevskaya, 234, kv. 6, all of Kiev; Veniamin Alexandrovich Ishunkin, ulitsa Tolbukhina, 7, kv. 142, Moscow; Anatoly Ivanovich Shevtsov, ulitsa Vorovskgo 5, kv. 9, and Semen Yakovlevich Grinshpon, ulitsa Butova 128, kv. 37, both of Kulebaki Gorkovskoi oblasti, all of U.S.S.R.

Filed Dec. 6, 1973, Ser. No. 422,159
Int. Cl. H05b *7/10*
U.S. Cl. 13—15 **1 Claim**

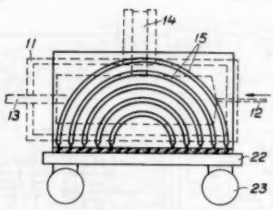


An installation for the electroslag melting of ingots comprising a column with a carriage secured thereon to carry an electrode holder with consumable electrodes to be melted in a cooled mould mounted on a bottom plate. The electrode holder has a standard head formed as a plate with holes for securing the consumable electrodes therein. The holes of the plate that have electric insulation are alternated with the holes lacking insulation.

3,832,477
MEANS FOR DIP-FORMING

Gosta Karlsson, Vasteras, and Borje Nilsson, Halsingborg, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed May 24, 1972, Ser. No. 256,588
Claims priority, application Sweden, June 3, 1971, 7154/71
Int. Cl. H05b *5/16*
U.S. Cl. 13—27 **3 Claims**

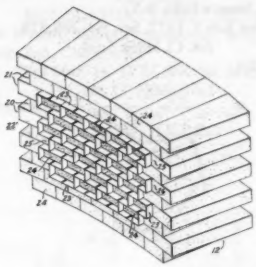


Wires, rods, or, tubes upon which melt is to be applied are passed through a dip-forming crucible. U-shaped heaters are placed at the sides of the crucible and can be moved away from the crucible.

3,832,478
METHOD FOR PREVENTING EARLY DAMAGE TO FURNACE REFRACTORY SHAPES

William C. Books, Hellertown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Dec. 5, 1973, Ser. No. 422,036
Int. Cl. F27b *3/16*; F27d *1/06*
U.S. Cl. 13—35 **13 Claims**

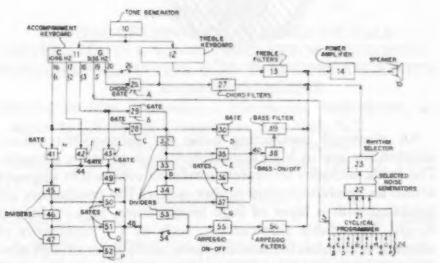


Method for preventing early damage to the refractory lining at critical wear areas in a metallurgical furnace, such as an electric arc furnace and the like, including laying-up the critical wear areas of the refractory lining with standard refractory shapes encased in metal. The metal cases extend a distance beyond the hot faces of the refractory shapes to form box-like configurations which act as receptacles and anchors to retain pulverulent refractory material which is subsequently sprayed over the hot faces of the refractory shapes prior to initial start-up of the furnace. The pulverunt sprayed refractory material insulates and protects the hot faces of the refractory shapes from a rapid rate of increase in temperature which occurs during initial melt down and heat up at the beginning of a campaign.

3,832,479
ELECTRONIC APPARATUS FOR PROGRAMMED AUTOMATIC PLAYING OF MUSICAL ACCOMPANIMENT SYSTEMS

Lucio M. Aliprandi, Aspio Terme Di Camerano, Italy

Filed Feb. 5, 1973, Ser. No. 329,640
Claims priority, application Italy, Mar. 1, 1972, 48667/72
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.03 **7 Claims**



An electronic circuit or apparatus which, when properly combined with a keyboard electronic instrument of the button

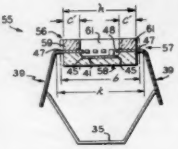
or similar type, allows automatic and programmable playing of musical accompaniments including basses, chords, arpeggio and scales, formed by notes and/or groups of notes played in periodical succession, all of which is correlated by a programmed rhythmical control.

3,832,480

INTERMEDIATE PACKAGE AND METHOD FOR MAKING

Thomas D. Bunker, Bradford, Pa., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed July 7, 1972, Ser. No. 269,570
Int. Cl. H05k *5/00*
U.S. Cl. 174—52 S **3 Claims**



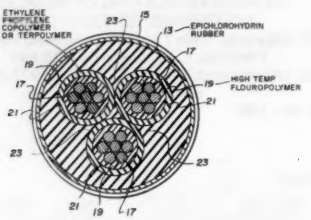
There is disclosed an improved intermediate package to be utilized in integrated circuits wherein the end portions of individual components leads and the lateral edges of the packages' central pad are substantially vertically aligned. Additionally, a method for making the above package is also disclosed.

3,832,481

HIGH TEMPERATURE, HIGH PRESSURE OIL WELL CABLE

Clinton A. Boyd, Tulsa, Okla., and Donatas Tijunelis, Buffalo Grove, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 4, 1973, Ser. No. 403,579
Int. Cl. H01b *3/18, 7/18, 7/02*
U.S. Cl. 174—102 R **9 Claims**



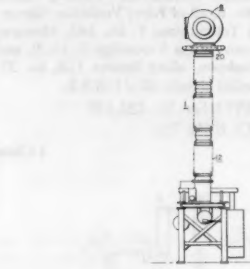
An electrical conducting cable for submersible motors adapted for use in high temperature high pressure oil wells. The cable includes separately insulated conductors disposed within an epichlorohydrin rubber jacket. The conductors are insulated with a layer of high temperature, high molecular weight, extrudable fluorcarbon, such as 1:1 copolymer of ethylene and chlorotrifluoroethylene, and a layer of high temperature thermosetting rubber, such as ethylene propylene copolymers and terpolymers, either layer being suitable as the primary insulation and the other layer as the secondary insulation. The jacketed cable unit is protected by an outer armor formed of a suitable metal. The cable thus formed is flexible, abrasion resistant, solvent resistant, liquid impervious, heat insensitive and unaffected by well environment.

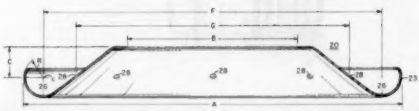
3,832,482

EHV RAIN-SHIELD AND VOLTAGE GRADING RING FOR HIGH-VOLTAGE EQUIPMENT

Charles W. Tragesser, Murrysville, and John R. Perulfi, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 17, 1972, Ser. No. 272,705
Int. Cl. H01b *17/48*
U.S. Cl. 174—141 R **5 Claims**





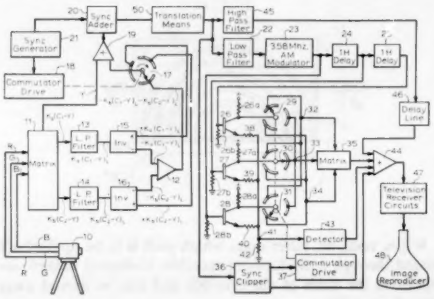
A combined rain-shield and voltage grading ring is provided for the upstanding insulating column of a high-voltage circuit interrupter, or of other high-voltage equipment, to provide a variety of functions, namely voltage-gradation along the length of the upstanding insulating column, and, additionally, to prevent the water from cascading down the column, which would reduce the voltage-withstand of the upstanding supporting column.

3,832,483

LINE SEQUENTIAL COLOR VIDEO ENCODING WITH EQUALLY CONTRIBUTED LUMINANCE

Howard F. Jirka, Mount Prospect, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 277,027, Aug. 1, 1972, abandoned. This application Dec. 27, 1972, Ser. No. 319,107
Int. Cl. H04n *9/34*
U.S. Cl. 178—5.4 CD **23 Claims**



An encoding system for color television signals wherein three color-difference signals representative of the color of a

scene and a luminance signal representative of the brightness of the scene are encoded as three-line sequential signals with relative amplitudes such that when the three sequential signals are matrixed in equal proportions a luminance signal is formed representative of the average luminance level of the picture over the preceding three lines.

3,832,484

METHOD AND MEANS FOR REPRODUCING A MIRROR-IMAGE RECORD OF A SUBJECT COPY IN A FACSIMILE MASTER-MAKING MACHINE

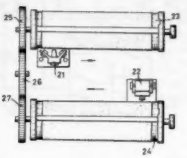
Akira Tanaka, Fujisawa, Japan, assignor to Gakken Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1972, Ser. No. 307,565

Claims priority, application Japan, Nov. 20, 1971, 46-93353; Mar. 23, 1972, 47-29236

Int. Cl. G03b *27/10;* **H04n** *1/14*

U.S. Cl. 178—6.6 B **15 Claims**



A scanning head and a recording head supported against a subject copy and a record medium wrapped side-by-side around a single rotary drum in relationship are caused to move synchronously in opposite directions, either away from or toward each other, parallel to the axis of the rotary drum in relation with the rotation thereof. A record of the subject copy thus reproduced on the record medium is reversed as to its left and right, so that the record medium can be used as a master in lithographic and other printing processes.

3,832,485

INFORMATION SELECTION IN IMAGE ANALYSIS SYSTEMS EMPLOYING LINE SCANNING

Leon Andre Pieters, Cambridge, England, assignor to Image Analysing Computers Limited, Melbourne, England

Filed Aug. 7, 1972, Ser. No. 278,235

Claims priority, application Great Britain, Aug. 7, 1971, 372261/71

Int. Cl. H04n *5/22, 7/18*

U.S. Cl. 178—6.8 **53 Claims**

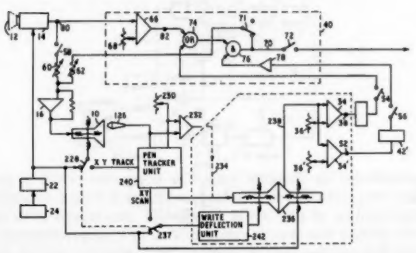


Image analysis apparatus and methods of operating same, having a surface on which outlines or areas can be delineated by hand, using either a light pen or conventional drawing instrument such as a pencil and near or on which a representation of a field under analysis is generated, a scanner for generating a video signal relating to the delineated outline or area in synchronism with the scanning of the field under analysis and circuit means for gating the video signal obtained from scanning the field, operated by pulses obtained from the video signal relating to the delineation.

3,832,486

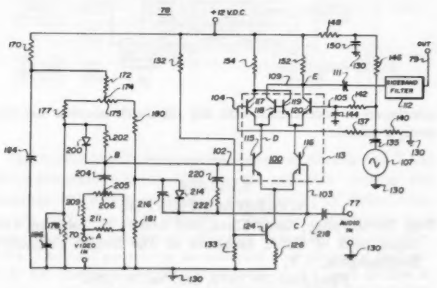
MODULATOR CLAMP CIRCUIT

Paul Victor Wanek, Mount Prospect, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed Mar. 16, 1973, Ser. No. 342,317

Int. Cl. H04n *5/40*

U.S. Cl. 178—7.1 **14 Claims**



A video tape recorder system includes a modulator circuit for modulating an RF carrier with video information derived from scanning a video tape. The modulator circuit is formed by a differential amplifier with a series capacitor-resistor network between a pair of inputs of the differential amplifier to effectively cancel, by means of common mode rejection, an AC portion of the video information. A diode-capacitor network connected with one differential amplifier input reinserts DC into the video information signal, and forms a part of a temperature compensated bias supply for the inputs of the differential amplifier.

3,832,487

METHOD OF CONVERTING IMAGE SIGNALS GENERATED IN A NON-INTERLACED MANNER INTO IMAGE SIGNALS INTERLACED IN ACCORDANCE WITH A TELEVISION STANDARD

Edmond de Niet, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1972, Ser. No. 310,344

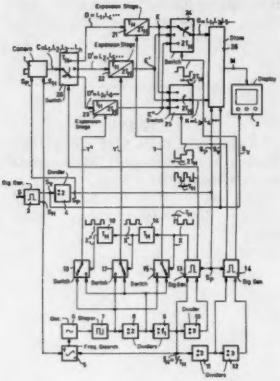
Claims priority, application Netherlands, Dec. 21, 1971, 7117542

Int. Cl. H04n *5/02*

U.S. Cl. 178—7.2 **10 Claims**

A method of converting image signals L_1, L_2 L_3 . . . L_n generated in a non-interlaced manner for standard display into interlaced signals L_1, L_3 . . . and L_2, L_4 . . . The image signals are split up into three groups L_1, L_4 . . . L_2, L_5 . . . and L_3, L_6 . . . whereafter the duration of occurrence of the image signals is extended from one line period to two subsequent line periods. Subsequently two groups of image signals L_1, L_3, L_5 . . . and L_2, L_4, L_6 . . . occurring for two line periods are formed which are

separately and simultaneously written in a store. By reading out the store at a rate which is twice as fast signals which are



interlaced in accordance with the standards become successively available.

3,832,488

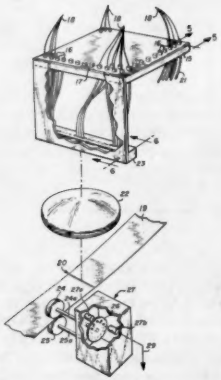
NON-IMPACT PRINTER

Wm. David Fahey, Santa Clara, and Robert W. Johnson, Los Altos, both of Calif., assignors to The Singer Company, Binghampton, N.Y.

Filed June 29, 1972, Ser. No. 267,586

Int. Cl. H04l *15/34;* **G09f** *9/34*

U.S. Cl. 178—15 **8 Claims**



A computer output microfilm printer which employs light-emitting diodes and flexible optic light guides to generate images to be printed on light sensitive film. The light guides have corresponding ends disposed in close proximity to the diodes for receiving light and opposite ends in a linear array which extends transversely of the film. The linear array of light guide ends is imaged on the film by means of a lens. The film is moved continuously in one direction past the optical image of light from the light guide array. By selective energization of the diodes, a complete line of characters is printed in linear segments in a line scan mode, by discrete points of light impinging on the film surface. A film-movement encoder provides mechanical synchronization pulses to control circuitry. Decoding circuitry subdivides characters to be printed into linear segments in response to character binary codes from an input data source. Switching circuitry energizes the diodes in response to the linear segment subdivisions from the decoding circuitry.

3,832,489

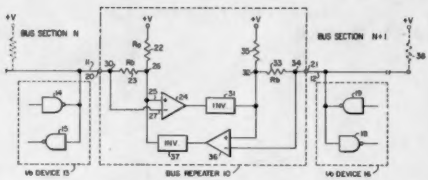
BIDIRECTIONAL BUS REPEATER

Rallapalli Krishna, Maynard, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 26, 1973, Ser. No. 334,951

Int. Cl. H04l *25/20*

U.S. Cl. 178—71 R **6 Claims**



A bus repeater circuit for interconnecting first and second corresponding transmission lines for first and second adjacent bidirectional electrical bus sections. The bus repeater circuit includes first and second current sensors associated with each transmission line to apply a bipolar signal to first and second amplifiers respectively. Output signals from a given sensor of a first polarity indicate that the associated transmission line is transmitting a signal. The associated amplifier couples that signal to the other bus wire. Signals of a second polarity indicate that the associated bus transmission line is not transmitting a signal to the repeater and the associated amplifier provides a corresponding signal, thereby avoiding a latched condition.

3,832,490

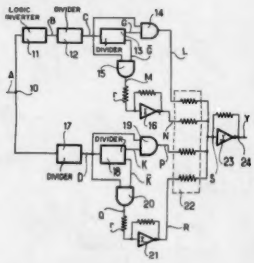
CODER FOR INCREASE OF TRANSMISSION SPEED

Didier Leonard, Boulogne-sur-Seine, France, assignor to Compagnie Industrielle Des Communication Cit-Alcatel, Paris, France

Filed Oct. 13, 1972, Ser. No. 297,229

Int. Cl. H04l *3/00*

U.S. Cl. 178—68 **6 Claims**



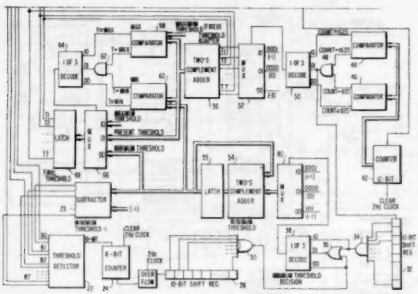
The invention concerns a device for transmitting binary values at a high speed in a channel having a limited bandwidth in the form of a signal having five levels. It is applied to transmission of asynchronous type.

3,832,491

DIGITAL VOICE SWITCH WITH AN ADAPTIVE DIGITALLY-CONTROLLED THRESHOLD

Joseph Albert Sciulli, Rockville, and Paul Andrew Lutz, Gaithersburg, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Feb. 13, 1973, Ser. No. 331,735
Int. Cl. H04b *15/00*
U.S. Cl. 179—1 VC 10 Claims



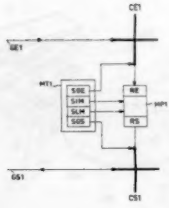
A voice switch for connecting voice PCM samples in a channel to an output line, said switch comprising a digital adaptive threshold generating means. The threshold level, against which voice samples are compared, is varied in accordance with the loudness of the talker by comparing the number of times the threshold is exceeded over a given period with a reference number. A variable minimum threshold level is also provided at a level just above the channel noise level.

3,832,492

PCM SWITCHING NETWORK PROVIDING INTERLEAVING OF OUTGOING AND INCOMING SAMPLES TO A STORE DURING EACH TIME SLOT

Pierre Charransol; Jacques Hauri, both of Paris, and Claude Athenes, Montreuil, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 17, 1972, Ser. No. 235,828
Claims priority, application France, Mar. 18, 1971, 71.09494
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 AT 5 Claims



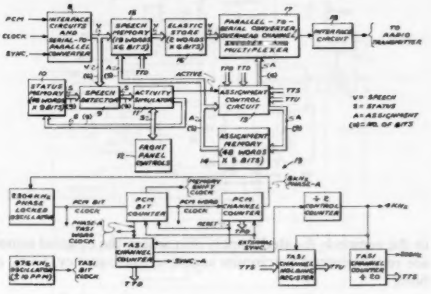
In a space-time-space switching network an interleaving technique is used to enable increased time (doubling) for read and write operations. The system is realized by adding input and output registers to an exemplary system and adding controls for the registers. The addition of the registers and controls specifically enables a coded sample from subscriber A to be read out in the speech store during a first cycle, a coded sample from subscriber B to be read out in the same store in the next cycle and to be transmitted through the network during the next cycle.

3,832,493

DIGITAL SPEECH DETECTOR

James M. Clark, Cedar Grove, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 18, 1973, Ser. No. 371,191
Int. Cl. H04j *5/00*
U.S. Cl. 179—15 AS 23 Claims



This relates to a digital speech detector applicable to a TASI communication system wherein the detector detects the presence or absence of speech in a plurality of digital code groups each of which indicate a quantized amplitude of a speech sample. The speech detector is divided into two portions. The first portion is an instantaneous detector that detects the quantized amplitude of each of the code groups in sequence and produces an up count signal when the detected quantized amplitude is greater than a first threshold value or less than a second threshold value less than the first threshold value and produces a down count signal when the detected quantized amplitude is between the first and second threshold values. The second portion includes an integrating counting circuit which integrates the up and down count signals and produces a resultant value of integration. The counting circuit produces a second output signal indicating speech activity in the code groups when the value of integration is above a third threshold value and produces a second output signal indicating an absence of speech activity in the code groups when the value of integration is below the third threshold value. The counting circuit has three different counting rates. The greatest counting rate occurs between a minimum count level and the third threshold value until the third threshold value is reached. An intermediate counting rate occurs between the third threshold value after it has been reached and a maximum count level until the maximum count level is reached. The smallest counting rate occurs between the maximum count level after it has been reached and the minimum count level until the minimum count level is reached again. The first output signal from the counting circuit is the signal that controls the assignment of those PCM code groups having speech activity to a particular one of the TASI channels transmitted from the transmitting portion of the TASI communication system.

3,832,494

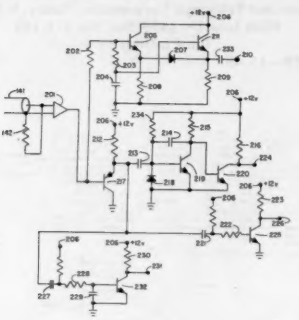
SIGNAL MULTIPLEXER AND DEMULTIPLEXER

Howard N. Seim, Minneapolis, Minn., and Neal E. Roebke, Greendale, Wis., assignors to Control Data Corporation, Minneapolis, Minn.

Filed June 10, 1970, Ser. No. 32,496
Int. Cl. H04j *1/08*
U.S. Cl. 179—15 BA 4 Claims

The synchronizing and data signals for the displaying of data on the face of a video display unit are multiplexed into one

composite signal by the use of voltage summing apparatus. The composite signal is transmitted on a single coaxial cable



to the remotely located display unit where the original signals are reconstructed by circuits sensitive to frequency, level, or both.

3,832,495

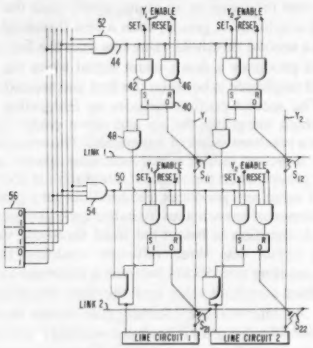
INFORMATION TRANSFER SYSTEM FOR A PBX

Norman Hovagimyan, and Murray Rosenblatt, both of Cherry Hill, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 18, 1972, Ser. No. 315,894

Int. Cl. H04q *3/50*

U.S. Cl. 179—18 GF **10 Claims**



In a private telephone branch exchange, including a cross-point switching matrix, a system for transferring non-verbal control information such as: dial pulse information: camp-on information: and message complete information. The control information is transferred between utilization devices, such as line circuits and registers, over a path which is external to the switching matrix.

3,832,496

LINK ACCESSING ARRANGEMENT INCLUDING SQUARE-WAVE CLOCK GENERATOR

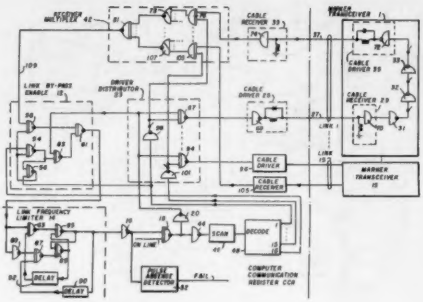
James J. Vrba, Berwyn, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 2, 1973, Ser. No. 320,398

Int. Cl. H04q *1/04*

U.S. Cl. 179—18 J **4 Claims**

A link accessing arrangement for supplying square-wave clock pulses from a common transceiver unit to a plurality of sub-system transceiver units via a plurality of links extending therebetween includes a logically inverting series circuit for providing an odd number of inversions, the output of the inverting circuit being coupled to its input to provide an unstable loop arrangement to generate the square-wave clock pulses, the loop including a portion of the common unit and a selected one of the links together with a portion of the sub-system unit associated therewith. A switching arrangement in



the common unit transfers selectively the links and their sub-system units into and out of the loop to cause the clock pulses to be supplied to and from the selected sub-system units, and a delay circuit connected in series in the loop located within the common unit limits the frequency of the clock pulse signals. A scanner in the common unit causes the switching circuit to transfer the links and their sub-system units sequentially in response to the clock pulses.

3,832,497

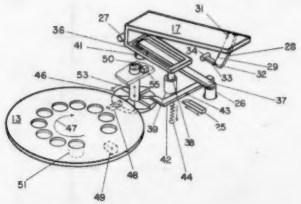
TELEPHONE ATTACHMENT FOR LIMITING DIALING

Kuno J. Vogt, 5854 Kanton Ct., San Diego, Calif. 92122

Filed Nov. 20, 1972, Ser. No. 307,816

Int. Cl. H04m *1/66*

U.S. Cl. 179—90 D **4 Claims**

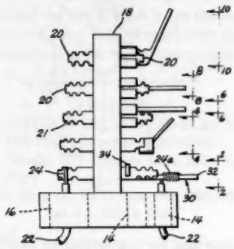


A telephone long distance attachment for attaching to a standard telephone on the outside housing thereof, without in any way dismantling the telephone, for preventing long distance calls and at the same time facilitating local calls in which a first ratchet mechanism limits the number of dialed digits to those required for a local call only, a second ratchet mechanism prevents dialing the operator on the first dial, a third ratchet mechanism prevents the release of the telephone buttons before they are fully pressed to prevent dialing by depressing the buttons.

3,832,498
ADAPTER ENABLING TELEPHONE SWITCHING EQUIPMENT TERMINALS TO BE WIRE WRAPPED

Edward L. Lawson, 538 N. Fifth St., Bayport, Minn. 55003

Filed Oct. 9, 1973, Ser. No. 404,647
Int. Cl. H04q 1/02
U.S. Cl. 179—98 9 Claims

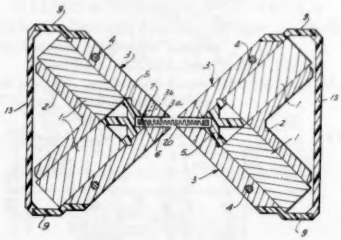


One end of an adapter structured in accordance with the invention is soldered to a terminal strip of a main distributing frame located in the central office of a telephone exchange. When so soldered, the adapter provides a shank having a square cross section that projects at a preferred angle so as to enable the shank to be wire wrapped by means of an appropriate tool, thereby obviating the need for any hand soldering of wires to the terminal strip as heretofore done. Inasmuch as main frames, even those of the same manufacturer, differ in construction, and obviously the terminal strips incorporated therein do too, several ways are herein disclosed for enabling my adapter to be soldered to the various terminal strips encountered in present installations.

3,832,499
ELECTRO-ACOUSTIC TRANSDUCER

Oskar Heil, 1775 Panott Dr., San Mateo, Calif. 94402

Filed Jan. 8, 1973, Ser. No. 321,826
Int. Cl. H04r 9/06
U.S. Cl. 179—115.5 PV 11 Claims

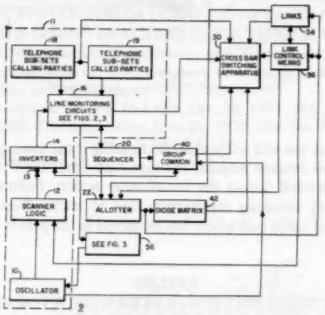


An electro-acoustic transducer comprising permanent magnet means producing a magnetic field and defining a space communicating with the outer atmosphere, and diaphragm means located in said space and comprising a corrugated sheet of flexible material and a metal foil applied in a meander pattern to at least one face of the plastic sheet.

3,832,500
AUTOMATIC TELEPHONE SYSTEM WITH IMPROVED LINE SELECTING APPARATUS

Ben A. Harris, Irondequoit, N.Y., assignor to Dynalec Corporation, New York, N.Y.

Filed Nov. 22, 1972, Ser. No. 308,741
Int. Cl. H04q 3/32
U.S. Cl. 179—186 E 6 Claims



An automatic telephone system utilizing matrix switching apparatus such as a crossbar switch and includes (1) a plurality of links wherein each link is responsive to a single appearance with respect to the cross-bar switch and (2) line selecting apparatus. The line selecting apparatus is coupled to the matrix switching apparatus and includes an oscillator which is effective to provide a stream of pulses, scanner logic responsive to such pulses to provide a plurality of level dependent function signals, particular ones of which correspond to decimal units and decimal tens respectively, with a particular combination of units and tens signals corresponding to a particular line; a plurality of monitoring circuits coupled to the scanner logic, each having a particular units terminal and a particular tens terminal and sequentially effective when each of these particular terminals simultaneously receives the function level signals to effect the actuation of a particular hold magnet in the crossbar switching apparatus. The scanner logic thereby causes the sequential actuation of line monitoring circuits and establishes crosspoints in the matrix switching apparatus for ringing and completing calls between an originating telephone subset and a terminating subset. The line selecting apparatus further includes a single current detector circuit coupled to the plurality of monitoring circuits and effective when one of such circuits is actuated for turning off the oscillator.

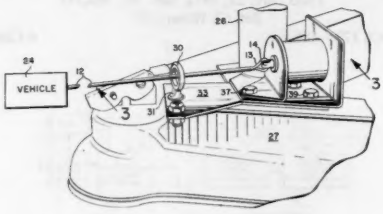
3,832,501
BREAK-AWAY SAFETY SWITCH MOUNTING BRACKET KIT

John J. Amnotte, Town & Country Mobile Park, Space 12, P.O. Box 2000A, Harbor, Oreg. 97415

Filed May 4, 1973, Ser. No. 357,221
Int. Cl. H01h 27/04
U.S. Cl. 200—61.19 5 Claims

There is disclosed an improved mounting bracket kit for providing a fail-safe actuation of the pull-plug or release pin of a conventional break-away safety switch. The bracket is suitable for use either as a retrofit to improve the reliability of operation of existing switch installations or for use with new original equipment. The mounting bracket kit is such as to provide support for both ends of a conventional pull-plug switch housing with respect to the trailer chassis and to provide a guide for the cable leading to the release pin of the switch which guide is also supported with respect to the trailer

chassis and is dimensioned and positioned so that the cable guide acts as a pivot point for the cable ensuring that the pull of the cable on the release pin will be along a straight line coinciding with the longitudinal axis of the pin or plug so that



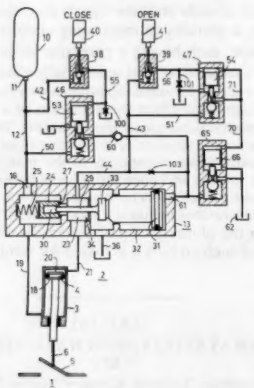
the release pin will not jam in the housing if the towing vehicle and trailer assume angular relationships other than that normally intended during the break-away action. Failure of the emergency breaking mechanism due to such off-axis components of cable pull which has occurred in the past is thus obviated.

3,832,502

ELECTRIC CIRCUIT BREAKER WITH HYDRAULIC ACTUATING MEANS INCLUDING A PLURALITY OF VALVES FOR OPENING THE BREAKER, AND A PLURALITY OF VALVES FOR CLOSING THE BREAKER

Gerhard Grieger, and Joaquin Bohrdt, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 26, 1972, Ser. No. 257,151
Claims priority, application Germany, June 4, 1971. 2128648
Int. Cl. H01h *35/38, 33/34, 33/88*
U.S. Cl. 200—82 B **12 Claims**



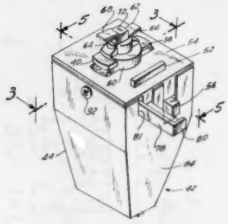
An electric circuit breaker is disclosed having a blast piston for compressing a gaseous quenching medium such as sulfur hexaflouride, and a hydraulic drive for the breaker which includes a main hydraulic actuator cylinder and piston and valves for controlling the admission of hydraulic fluid into the cylinder. In addition, for closing the circuit breaker a hydraulic latching arrangement is discosed which is associated with the valve closest to the main actuator cylinder in an application where there are more than two series-connected valves for closing the breaker. For opening the breaker, a hydraulic latching arrangement is disclosed which is associated with a valve which is separated from the main actuator cylinder by at least one further valve.

3,832,503

TWO CIRCUIT TRACK LIGHTING SYSTEM

Roy B. Crane, Wilmington, Mass., assignor to Keene Corporation, New York, N.Y.

Filed Aug. 10, 1973, Ser. No. 387,387
Int. Cl. H01r *13/70*
U.S. Cl. 200—51 R **7 Claims**



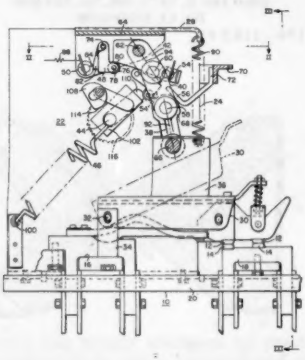
A device is provided for connecting an electrical fixture to a three-conductor, two-circuit power distribution track. The device includes a housing adapted to be secured to the track containing a fixed contact adapted to engage one conductor and a movable contact adapted to be shifted to a proper position to engage either of the other two conductors. Movement of the second contact is controlled by an indicator which extends outside the housing. The indicator assumes two positions corresponding to the positions of the contact with both positions being readily visible when the device is secured to a track so as to provide a clear indication of the circuit associated with the fixture.

3,832,504

CIRCUIT BREAKER WITH SPRING CLOSING MEANS AND PAWL AND RACHET SPRING CHARGING MEANS

Albert R. Cellerini, and Stephen S. Dobrosielski, both of Beaver, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1973, Ser. No. 391,920
Int. Cl. H01h *5/10*
U.S. Cl. 200—153 SC **10 Claims**



A circuit breaker characterized by stationary and movable contacts operable between open and closed positions, means including a crank shaft structure, pawl and rachet, and spring means for opening and closing the contacts, a toggle structure connected to the movable contact and comprising a first link, a second link, and a toggle lever; the first link being pivotally

connected to the second link, the second link being pivotally connected to the toggle lever, the crank shaft structure having a cam surface movable against the joint of the links for moving the toggle structure from the open to the closed positions, first releasable latch means for retaining the toggle structure in the contacts closed position, stop means limiting movement of the first and second links beyond a position where a line through the pivotal connections of the first link and the movable contact mounting means and of the first and second links projects on the side of the pivotal connection of the second link and toggle lever opposite the crank shaft when the toggle structure is in the open position, and second releasable latch means for retaining the crank shaft in the spring charged position.

3,832,505

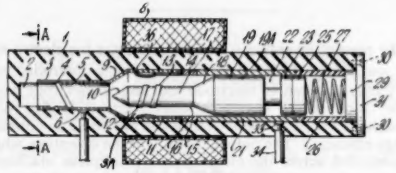
PISTON ACTUATED SWITCH WITH SCREW THREADS ON PISTON AND HOUSING

Franklin Victor Wong, 777 County Line Rd., Apt. 23A, Amityville, N.Y. 11701

Filed May 15, 1973, Ser. No. 360,462

Int. Cl. H01h *3/40*

U.S. Cl. 200—158 **5 Claims**



The invention comprises a cylindrical housing having an internal telescopic split bore for receiving a solenoidally actuated piston. The piston has an extremity spring biased and anchored and the other extremity has disposed thereon a resistive contact. The split bore is conductively coated and separated by an insulative medium. The resistive contact on said piston is disposed to engage one of said conductive contacts in response to the excitation of the solenoid to permit conduction under the control of the resistive contact. Removal of the excitation permits the piston to return to its original position under the control of the spring bias. The amplitude of make and break of contact currents is controlled by the resistive element during the initial stages of switching.

3,832,506

ILLUMINATED PUSH BUTTON SWITCH

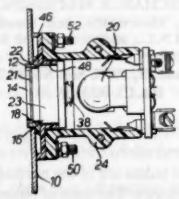
Alan Dewhurst, Denham, England, assignor to Dewhurst & Partner Limited, Middlesex, England

Filed Sept. 17, 1973, Ser. No. 397,725

Claims priority, application Great Britain, Mar. 21, 1973, 13691/73; June 22, 1973, 29818/73

Int. Cl. H01h *9/16, 9/18*

U.S. Cl. 200—314 **8 Claims**



The electrical switch described has a push button actuator having an imperforate steel facing and a transparent backing member and fits in an aperture in a steel face plate with clearance around it. A lamp is disposed behind the backing member, light from the lamp being guided by a skirt on the backing member and escaping at shoulders on the skirt to illuminate the clearance, so as to provide a tell-tale indication on illumination of the lamp.

3,832,507

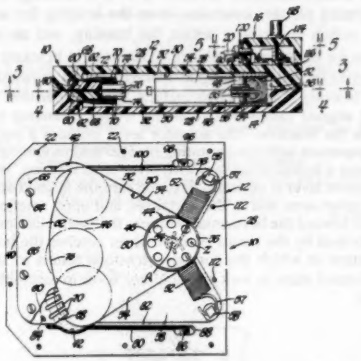
SENSOR SWITCH FOR OCCUPANT RESTRAINT SYSTEM WITH SPRING FRACTURE DETECTION MEANS

James F. Marquardt, Wauwatesea, and Vincent A. Orlando, Greenland, both of Wis., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 191,859, Oct. 22, 1971, Pat. No. 3,765,699. This application June 26, 1973, Ser. No. 373,684

Int. Cl. H01h *35/14*

U.S. Cl. 200—61.45 R **9 Claims**

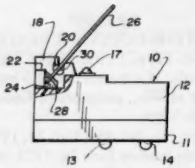


A vehicle includes a bumper or other portion which experiences a rapid change in velocity upon vehicle impact with an obstacle, an occupant compartment, an inflatable occupant restraint cushion within the compartment, and a source of pressure fluid for inflating the cushion. A sensor primarily responsive to the change in velocity of the bumper or other portion of the vehicle includes a housing of dielectric material having a sector-shaped recess, a spool-shaped mass of electrically conductive material slidable within the recess, and a pair of tension springs of electrically conductive material which are hooked between the mass and the housing to maintain the mass in unactuated position in engagement with the side walls of the recess adjacent the apical end thereof. The sensor is mounted on the bumper or other portion and is subjected to the velocity change thereof upon vehicle impact with an obstacle. The time for the mass to travel to actuated position is comparable within an order of magnitude to the deceleration time period of the sensor whereby movement of the mass to actuated position is responsive to the occurrence of a change in vehicle velocity above a predetermined value. When the mass moves to actuated position, it completes an electrical circuit across a pair of contacts located adjacent the basal end of the recess to initiate release of the pressure fluid to the cushion for inflation thereof. The springs and mass and the spring anchors to the housing are connected across a source of power in a diagnostic circuit so that any fracture of either spring can be detected.

3,832,508
MICRO-LEVER SWITCH OPERATOR

Frederick R. Beck, Valparaiso, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

Filed Mar. 29, 1973, Ser. No. 346,004
Int. Cl. H01h 3/04
U.S. Cl. 200—332 4 Claims



A switch assembly includes a switch housing, a switch operating plunger extending from the housing for actuating the switch mechanism within the housing, and an actuator lever for the operating plunger positioned in brackets molded integral to and extending in spaced relation outwardly from the housing. The brackets include aligned apertures therein, and aligned ramps and retaining ledges extending inwardly from the brackets. The actuator lever includes a portion for engagement with the operating plunger and mounting portion having a forked extension with pivot arms thereon. When the actuator lever is vertically inserted into the aligned apertures, the pivot arms rest in the apertures, and upon rotation of the lever toward the horizontal position, the forked extensions are deformed by the ramps until the lever reaches the horizontal position at which the forked extensions return to their undeformed state to lock the actuator lever in assembled position.

3,832,509
SPLIT-TYPE MAGNETIC FIELD CONCENTRATOR

Valery Mikhailovich Mikhailov, Komsomolsky prospekt, 10, kv. 150, and Silvia Izrailevna Pisarevskaya, ulitsa Shexpira 10, kv. 25, both of Kharkov, U.S.S.R.

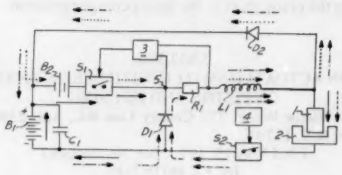
Filed May 29, 1973, Ser. No. 364,408
Int. Cl. B23k 13/00
U.S. Cl. 219—7.5 2 Claims

A split-type magnetic field concentrator to be used in an inductor for magnetic pulse treatment of metals, consisting of two parts which, when joined together, form an aperture for placing therein an article being treated, said parts of the split-type concentrator are insulated from each other in one joint by means of an insulating gasket and contact each other in the other joint, the contacting end of one of the parts being provided with a recess to improve the electric contact between said parts.

3,832,510
PULSE GENERATOR FOR EDM MACHINE

Jean Pfau; Georges-Andre Marendaz, and Heinz Rhyner, all of Geneva, Switzerland, assignors to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed June 8, 1973, Ser. No. 368,220
Claims priority, application Switzerland, June 16, 1972 9044/72
Int. Cl. B23k 9/16
U.S. Cl. 219—69 C 24 Claims



The present invention is a pulse generator for electro-erosion machining which is capable of providing controlled voltage pulses between an electrode tool and an electrode workpiece, such pulses having a sharp vertical leading edge throughout a wide frequency range and providing an optimum energy efficiency. The pulse generator of the invention, which is connected across the electrode tool-workpiece machining gap, comprises essentially a DC power supply, an electromagnetic energy storage element and a first circuit make and break element, such as a switch, connected between one of the DC power supply terminals and one of the terminals of the electromagnetic storage device. A first unidirectional element is connected between the first terminal of the electromagnetic storage element and the other terminal of the power supply, so as to provide a current path through a first auxiliary circuit when the first circuit make and break element is open. The circuit comprises a second unidirectional element connected between one of the power supply terminals and one of the electrodes, tool or workpiece, and a second circuit make and break element or switch connected so as to provide a current path, when the second circuit make and break element is open, through a second auxiliary circuit, or through a third auxiliary circuit when both circuit make and break elements are open. The first circuit make and break element is controlled in such manner as to cause the current flowing across the energy storage element to be maintained at a predetermined value and the second circuit make and break element is controlled so as to control in turn the duration of each voltage or current pulse and/or the time interval during two consecutive voltage pulses.

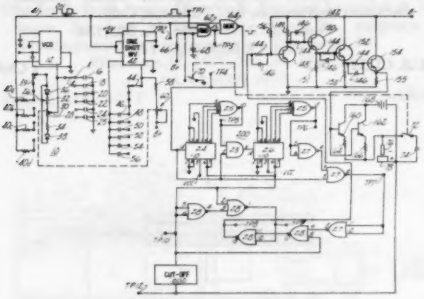
3,832,511
SHORT CIRCUIT PROTECTION SYSTEM FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

Oliver A. Bell, Jr., Mooresville, and Randall C. Gilleland, Statesville, both of N.C., assignors to Colt Industries Operating Corp., New York, N.Y.

Filed June 25, 1973, Ser. No. 373,377
Int. Cl. B23k 9/16
U.S. Cl. 219—69 P 17 Claims

The system is one which responsive to gap short circuit condition allows a predetermined train or series of pulses to be applied to the gap. The pulses are of the normal machining pulse on-off time and frequency. The train of pulses is applied and is then followed by an off-time interval several times the duration of the first train. The system includes a gating and a counter system in which there is included a divide-by-ten stage

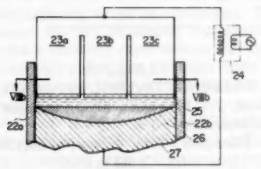
to provide the predetermined series of pulses responsive to gap short circuit condition. The system further includes a series of gates and inverters which inhibit pulses from being fed during the predetermined relatively long off-time interval.



3,832,512
ELECTROSLAG WELDING PROCESS

Yasuhiro Nishio; Zenichiro Okamoto, and Yoshinori Hiromoto, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1973, Ser. No. 337,853
Claims priority, application Japan, Mar. 8, 1972, 47-23717
Int. Cl. B23k *25/00*
U.S. Cl. 219—73 4 Claims



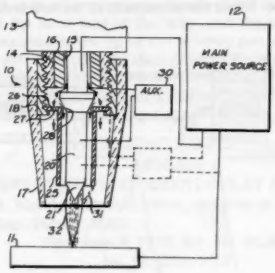
The process employs at least one metal plate electrode inserted into a welding gap between opposed surfaces of base metals to be weld united. At least that portion of the electrode length to be consumed by welding is divided into a plurality, preferably three, of substantially equal width sections spaced laterally from each other. The center section, or the center portion of the width of the electrode, has a thickness in excess of the thicknesses of the outer sections or the outer portions of the width of the electrode. All the sections of each inserted electrode are connected to the same respective single terminal of a welding power source.

3,832,513
STARTING AND STABILIZING APPARATUS FOR A GAS-TUNGSTEN ARC WELDING SYSTEM

George A. Klasson, 4430 Azalea Ln., North Olmsted, Ohio 44070

Filed Apr. 9, 1973, Ser. No. 348,877
Int. Cl. B23k *9/16*
U.S. Cl. 219—75 2 Claims

A method and apparatus for starting and stabilizing an arc in the gas-tungsten arc welding system and the like. A plasma flame extending from the tungsten electrode to the work is established by ionizing a portion of the flow of inert gas used for shielding. The gas is ionized by means of an auxiliary arc that is struck between the tungsten electrode and a second metal component of the torch acting as a second electrode.

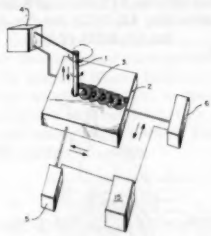


The resulting plasma flame provides a conductive path for starting and stabilizing the main arc struck between the tungsten electrode and the work.

3,832,514
DEVICE FOR LOCAL ELECTRIC-SPARK LAYERING OF METALS AND ALLOYS BY MEANS OF ROTATING ELECTRODE

Bogomil Totev Antonov, Sofia, Bulgaria, assignor to DSO "IZOT", Sofia, Bulgaria

Filed Nov. 27, 1972, Ser. No. 309,900
Claims priority, application Bulgaria, Nov. 27, 1971, 19113
Int. Cl. B23k *9/04*; C23c *15/00*
U.S. Cl. 219—76 8 Claims



A method is provided for local electric-spark layering of metals and alloys by means of a rotating electrode, wherein a layering electrode of rod shape and with a diameter smaller than 2 mm is rotated around its axis, said electrode being maintained from the surface to be layered at a distance in function of the disruptive voltage and the current, wherein the electrical impulses have at idle running 15 to 600 Volts and duration of from 1 to 10 microseconds. A device for accomplishing this method is also provided.

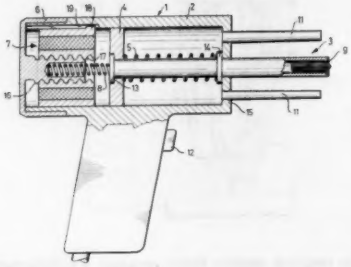
3,832,515
WELDING GUN FOR CONDENSER DISCHARGE BOLT WELDING

Dankmar Tauern, Triesenberg, Germany, assignor to Hilti Aktiengesellschaft, Schaan, Fuerstentum, Liechtenstein

Filed July 6, 1973, Ser. No. 377,011
Claims priority, application Germany, July 7, 1972, 2233609
Int. Cl. B23k *9/20*
U.S. Cl. 219—98 7 Claims

In a bolt welding gun for condenser discharge bolt welding, a bolt holder is axially displaceable within the gun housing and

is secured in position ready to weld a bolt by a magnet device located in the housing. The magnet device consists of two parts and one is mounted on the bolt holder and is axially displaceable relative to it. A compression spring drives the bolt holder toward the receiving material when the magnet device is de-activated. When the movement of the bolt holder toward



the receiving material is stopped, the magnet part mounted on it continues to move in the direction of the bolt. A spring is provided on the bolt holder and contacts the magnet part mounted on it so that, as the magnet part moves relative to the bolt holder, the spring provides a damping effect on the magnet part.

3,832,516

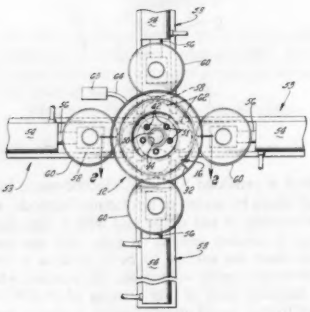
WELDING APPARATUS AND WELDER HEAD

Harold R. Baker, Lynwood, Calif., assignor to Norris Industries, Los Angeles, Calif.

Continuation-in-part of Ser. No. 63,992, July 23, 1970, , which is a division of Ser. No. 819,683, April 28, 1969,. This application May 12, 1972, Ser. No. 252,657

Int. Cl. B23k *11/06*

U.S. Cl. 219—81 **14 Claims**



Electrical resistance welding apparatus suitable for securing an insertable spider in the annular rim of a wheel includes a plurality of circumferentially spaced apart opposed electrodes each for forming a seam weld made up of a series of overlapping welds. Each electrode set includes an inner and outer wheel type welder head. The inner head includes a conductive shaft having a conductive sleeve rotatably mounted thereon. The sleeve carries the inner wheel electrode and is also tiltably mounted on the shaft so that weld pressure upon the inner wheel electrode tilts the sleeve against the shaft. Thereby, the weld pressure maintains good electrical contact between the shaft and sleeve, even as the sleeve rotates, to prevent arcing therebetween.

3,832,517

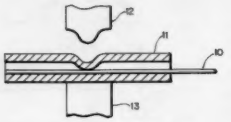
METHOD OF WELDING COATED WIRES TO ELECTRICAL CONDUCTORS

Randolph Charles Carson, Cypress, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 2, 1972, Ser. No. 303,134

Int. Cl. B23k *9/28, 11/10*

U.S. Cl. 219—92 **1 Claim**



A fine metallic wire having a thermoplastic insulative coating is welded to a larger metallic conductor by inserting the wire between opposing surfaces of the conductor and applying to the conductor an electrode heated by electrical current to a temperature above the melting point of the conductor. Heat from the electrode causes the conductor to fuse to the wire. The coating on the wire is softened by the heat of the conductor and displaced by the conductor so that electrical conductivity between the conductor and the wire is established. Surprisingly, the mechanical strength and electrical conductivity of the weld are not adversely affected by the coating, which in the prior art was always removed prior to welding.

3,832,518

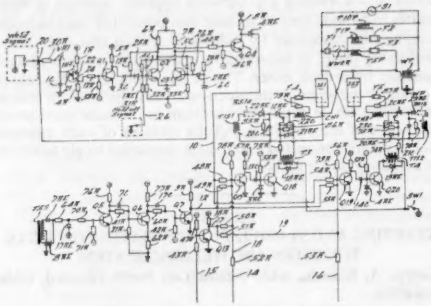
WELDING CONTROL APPARATUS

George O'Neal, Jr., Plymouth, Mich., assignor to Weltronic Company, Southfield, Mich.

Filed July 24, 1970, Ser. No. 58,126

Int. Cl. B23k *9/10*

U.S. Cl. 219—110 **119 Claims**

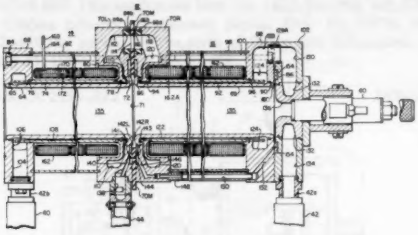


A firing control system for controlling controllable rectifier devices to control the transfer of energy from a source of energy to a workpiece to be welded and for establishing controlled firing sequences and times.

3,832,519
ARC HEATER WITH INTEGRAL FLUID AND ELECTRICAL DUCTING AND QUICK DISCONNECT FACILITY

Charles B. Wolf, Irwin; Maurice G. Fey, and Frederick A. Azinger, Jr., both of Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 11, 1972, Ser. No. 279,895
Int. Cl. B23k 9/00
U.S. Cl. 219—121 P **4 Claims**

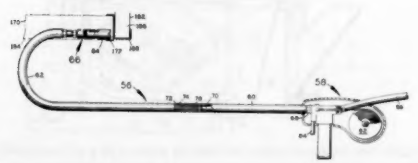


An arc heater having simplified construction allowing the use of electrodes of varying length and field coils of varying number and employing a field coil cooling fluid manifold which is adapted to provide cooling fluid and electrical power to discrete field coil assemblies. The apparatus includes an internal process gas metering orifice between electrode assemblies to allow the flow of process gas from a downstream gas entry port to an upstream gas admission ring and thence to the arc chamber in addition to a central gas admission ring disposed longitudinally between electrodes. The upstream ducting channel for the previously described process gas system includes a metering valve therein for volume control. The arc heater apparatus also includes fluid tight sealing means in a unitary electrode cooling channel. This sealing means is disposed parallel to the gap between the separable electrodes of the arc heater apparatus. When the arc heater is in an operable disposition the sealing means utilize the cooling fluid pressure to enhance sealing. The sealing means also has a special insulating configuration to increase the electrical insulation between electrodes in the electrode cooling path of differing electrical potential.

3,832,520
WELDING HOOK

Fred A. Glasser, Fort Lauderdale, Fla., assignor to Behring Corporation, Fort Lauderdale, Fla.

Continuation of Ser. No. 239,525, March 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 164,251, July 20, 1971, abandoned. This application May 25, 1973, Ser. No. 363,812
Int. Cl. B23k 9/28, 9/00
U.S. Cl. 219—130 **10 Claims**

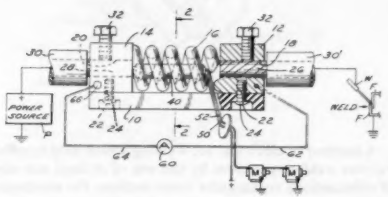


A welding hook for use with a welding tool such as a gun or torch having a tip through which welding wire is supplied, the hook including an electrically conductive tube having an elongated shank which merges into a hook portion at one end of the tube that curves back toward but short of the other end of the tube. A liner extends through the tube, and the wire is fed through the tube. The tube and the wire are in electrical contact with each other at the hook end of the tube. A tip is provided at the hook end of the tube, and the other end of the tube is secured to the tip of the welding gun, so that wire and current are supplied from the welding tool through the tube to effect the weld with the wire. Inert gas may also be supplied through the tube for shielding. A fiberscope may be mounted on the welding hook to make the work visible.

3,832,521
CURRENT SHUNT-CURRENT RELAY ASSEMBLY

Erling H. Niendorf, Detroit, Mich., assignor to Expert Automation, Inc., Detroit, Mich.

Filed June 8, 1970, Ser. No. 44,340
Int. Cl. B23k 9/10
U.S. Cl. 219—131 **4 Claims**

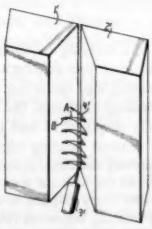


A current shunt-current relay assembly in the form of a cast copper coil having connecting end blocks for receiving cable ends. Within the coil is mounted a reed switch entrapped by the cable ends intended to be sensitive to current in the coil to provide suitable shut-off when current falls below a predetermined level. The coil and blocks form a current shunt which may be used with accessory circuits to operate independently of current fluctuations in the shunt to thus avoid instability in control of the accessory circuits which would be occasioned by the use of the reed switch alone.

3,832,522
WELDING PROCESS AND APPARATUS

Masayasu Arikawa; Atsushi Ohi, both of Fujisawa; Toshio Arai, Kamakura; Akihiko Iochi, Odawara, and Hironosuke Kada, Fujisawa, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed July 10, 1972, Ser. No. 270,008
Int. Cl. B23k 9/00
U.S. Cl. 219—137 **12 Claims**



In a welding process, the consumable tip of a welding electrode is provided with an oscillating motion, and in one cycle

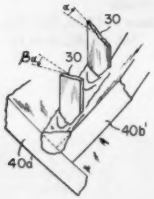
of the oscillation, the characteristics of the arc being generated are changed in two or more ways according to a predetermined program, and the tip is thus advanced in a zig-zag manner along the welding line to thereby attain an improved weld zone eliminating defects of the prior art.

3,832,523

METHOD FOR ELECTRICAL ARC WELDING

Toshio Kitani, Kobe, and Hisao Goto, Takatsuki, both of Japan, assignors to Osaka Transformer Co., Ltd., Osaka-fu, Japan

Filed Apr. 17, 1972, Ser. No. 244,720
Int. Cl. B23k 9/00
U.S. Cl. 219—137 **23 Claims**



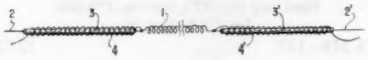
A method of electrical arc welding which may be effected in various welding positions by the use of at least one electrode of substantially rectangular cross section, the electrode tip of which is square-edged or shaped to fit with the shape of a groove formed between workpieces to be welded, the electrode being disposed in such a way as to render the widthwise direction thereof oriented substantially at right angles to the weld line along which a weld is to be formed. Also disclosed is an apparatus for electrical arc welding which is capable of performing the concurrently proposed arc welding method.

3,832,524

HEATING UNIT FOR COPYING MACHINE

Koichi Takiguchi, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1973, Ser. No. 387,311
Int. Cl. H05b 1/00
Claims priority, application Japan, Aug. 23, 1972, 47-97663
U.S. Cl. 219—216 **3 Claims**



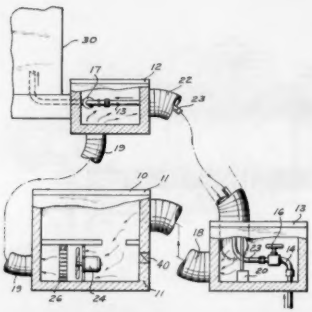
Circuitry for use in a copying machine capable of copying on copy papers of at least two different widths comprising a voltage source; a heating unit including a central heating element and two end heating elements, the latter elements being substantially coaxially disposed at and connected to the opposite ends of the central heating element; and switching means for: (1) connecting the central and two end heating elements in parallel across the voltage source when the larger of the two different width copy papers is used, and (2) disconnecting the two end heating elements from the voltage source when the smaller of the two different width copy papers is used to thereby optimize power consumption from the voltage source while at the same time accommodating different sized copy papers.

3,832,525

AUTOMATIC HEATING DEVICE TO PREVENT FREEZING OF WATER SUPPLY LINES

Vernon W. Stanton, and Ernest M. Shipley, both of Tucumcari, N. Mex., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 26, 1973, Ser. No. 344,778
Int. Cl. F24h 1/00
U.S. Cl. 219—301 **2 Claims**



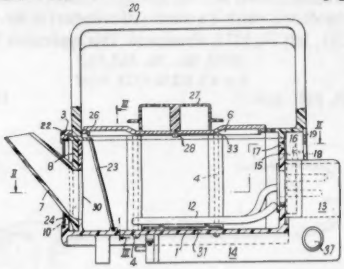
Heating apparatus for protecting the external water lines of a mobile home from freezing. The apparatus consists of an insulated duct surrounding the external water line of a mobile home with means to continuously circulate hot air through said duct when the temperature threatens to approach the freezing level. A hot air blower powered by a fan that is driven by an electric motor blows hot air into one end of the duct housing and draws back cooled air from the other end of the duct housing. A pressure relief valve is mounted in the duct housing so as to equalize any difference between the external atmospheric pressure and the pressure of the air inside the duct.

3,832,526

ELECTRICALLY HEATED KETTLES WITH A HEAT CONTROL

Georges Jean Louis-Marie Clausse, Ialeham, England, assignor to Belling and Company Limited, Enfield, Middlesex, England

Filed June 18, 1973, Ser. No. 370,757
Claims priority, application Great Britain, June 19, 1972, 28691/72
Int. Cl. F27d 11/02
U.S. Cl. 219—441 **5 Claims**



An electric kettle having a body comprising a base, a side wall integral with the base, the base and the side wall being of

plastics material capable of withstanding boiling water, and an upper rim member secured on the upper edge of the side wall. An electric heating element operatively positioned within the kettle and a metal plate bridge member separating said electric heating element from the plastic base.

3,832,527

DEFOGGING GLASS PLATE

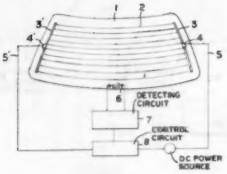
Takeomi Nagasima, Yokohama, Japan, assignor to Asohi Glass Company, Limited, Tokyo, Japan

Continuation of Ser. No. 206,728, Dec. 10, 1971, Pat. No. 3,749,885. This application Mar. 28, 1973, Ser. No. 345,528

Claims priority, application Japan, Dec. 18, 1970, 45-126498The portion of the term of this patent subsequent to July 31, 1990, has been disclaimed.

Int. Cl. H05b *3/06*

U.S. Cl. 219—522 **2 Claims**



A defogging glass plate includes an electric heating element, such as being made of conductive films or electric resistance strips for electrically heating the glass plate, and a sensor having a pair of electrodes which are arranged in parallel with a suitable gap and which are fitted on the surface of the glass plate, for automatically controlling the application of heat to the glass plate depending on the cloudiness or visibility thereof.

3,832,528

MICROFICHE FILM DETECTION DEVICE FOR MICRO-READERS AND MICRO-READER-PRINTERS

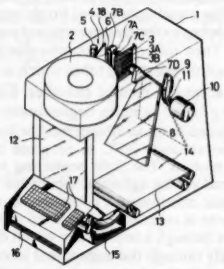
Takeshi Abe, Yokohama, Japan, assignor to Ricoh Co. Ltd., Tokyo, Japan

Filed Sept. 13, 1972, Ser. No. 288,559

Claims priority, application Japan, Sept. 14, 1971, 46-70920; Oct. 1, 1971, 46-76297

Int. Cl. G06k *7/14*

U.S. Cl. 235—61.11 E **11 Claims**



Disclosed is a detection device for micro-readers and micro-reader-printers adapted to successively read out sets of code indications from microfiche film sheets stored in a storage case for the purpose of detecting and withdrawing from the case a desired film sheet. In one embodiment, the detection device comprises a detection light source, a detection light receiving element, at least one reflector attached to each of the microfiche film sheets stored in the film storage case, and a plurality of sets of code indications each provided on the surface of the reflector or on a portion of each microfiche film sheet which is disposed in the path of travel of the light from the detection light source when the microfiche film sheet is indexed to a sensing position. The reflector may be on a clip attached to a marginal portion of each film sheet or it may be on the film sheet storage case. Different embodiments of clips, reflectors and storage cases are disclosed.

3,832,529

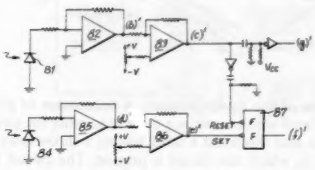
READING SYSTEM FOR TAGS ENCODED WITH BARS OF DIFFERENT WIDTHS

Koichi Nakamura, Suwa, Japan, assignor to Kabushiki Kaisha Seiwa Seikosha, Tokyo, Japan

Filed May 7, 1973, Ser. No. 358,121

Int. Cl. G06k *7/10*; **G08c** *9/06*

U.S. Cl. 235—61.11 E **7 Claims**



A device for reading information encoded in the form of bars of two widths. The device comprises an illuminating section for illuminating the bars and concentric detecting sections corresponding respectively in width to the width of the aforementioned bars. The detectors are physically related to the illuminating portion to detect the illumination of the bars thereby. The detectors may be optical fiber bundles. The innermost of the detectors is preferably columnar. A method of the invention consists of translating a row of bars of different widths into information bits by scanning the bars to illuminate the same and to pick up reflected light with two associated light detectors, the widths of which correspond, as noted above, to the width of the bars. The picked up light by the detectors is converted into electrical pulses, the magnitude of which is limited to form rectangular pulses of width corresponding to the aforesaid bars. The magnitude of the pulses generated by the wider detector is detected to generate pulses correponding only to the wider bars. The latter pulses are terminated in synchronism with the corresponding rectangular pulses. The bars are preferably made of one color.

3,832,530

OBJECT IDENTIFYING APPARATUS

Herbert J. P. Reitboeck, and Thomas F. Brody, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

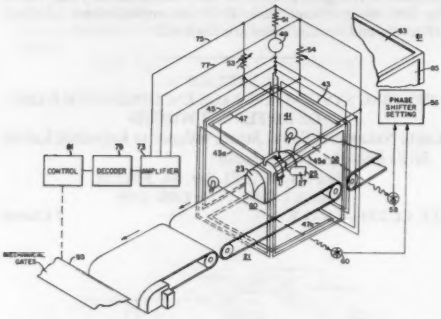
Continuation of Ser. No. 215,333, Jan. 4, 1972, abandoned. This application July 19, 1973, Ser. No. 380,928

Int. Cl. G06k *7/10, 19/06*; **G08b** *13/14*; **G01s** *9/56*

U.S. Cl. 235—61.11 H **12 Claims**

There is disclosed object identifying apparatus for an object carrying an identifying label having an identifying electrical circuit and moving or being moved through a region where the identifying circuit is read. Typically, the object is a mail sack or baggage which is to be directed along a predetermined path. When the object moves through the region, the label is randomly positioned in the region. A substantially homogeneous electromagnetic field is produced in the region and as the

object moves through the region, the circuit on the label is powered by, and reacts with, the field, absorbing energy from the field. The circuit on the label includes counter elements such, as a chain of multivibrators which are flopped from OFF to ON in predetermined succession. A circuit is connected to the field which differentiates the energy absorbed by the flopping of the multivibrators responding to the changes in the



conduction of the multivibrators. A succession of pulses are thus produced which serve as a code to identify the object.

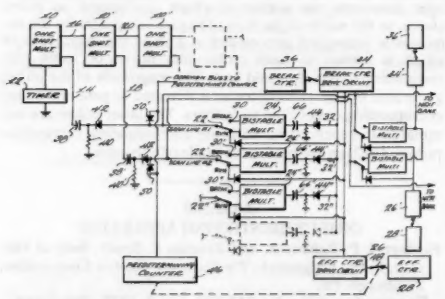
There is also disclosed a label having a throwaway flexible substrate on which the circuit is printed. The circuit includes an antenna connected to the counting elements, for example, interrupted-ring counters or shift registers. The circuit may be set for different codes.

3,832,531

OPERATION MONITORING SYSTEM

Henry R. Neill, Clarksville, and Robert G. Davies, Boydton, both of Va., assignors to Burlington Industries, Inc., Greensboro, N.C.

Division of Ser. No. 1,814, Jan. 9, 1970, Pat. No. 3,660,972.
This application Dec. 6, 1971, Ser. No. 205,101
Int. Cl. H03K *21/36*
U.S. Cl. 235—92 PD **5 Claims**



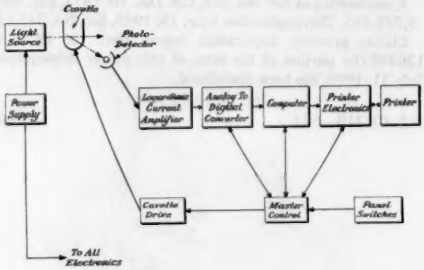
An operation monitoring system which may be adapted for use to monitor numerous types of operations and which is applicable to the monitoring of multi-spindle textile winding operations. The system is adapted to determine the efficiency of the operation and to count the number of unscheduled events which occur, such as yarn breaks in the multi-spindle textile winding operation. Scan pulse providing means produce a series of pulses which are registered by an efficiency counter when the operation is proceeding in a normal manner and a second counter registers the number of unscheduled events or yarn breaks which occur.

3,832,532

METHOD AND APPARATUS FOR TESTING ANTIBIOTIC SUSCEPTIBILITY

Julius Praglin, East Lyme; James E. McKie, Jr., Ledyard; Alan C. Curtiss, Old Lyme, and David K. Longhenry, East Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Aug. 18, 1972, Ser. No. 281,946
Int. Cl. G06f *15/20*; C12k *1/00*
U.S. Cl. 235—151.3 **29 Claims**



The light scattering of a number of aliquots of a given bacterial/broth suspension, each containing a different antibiotic are rapidly measured and compared with the forward light scattering of a control suspension of the bacteria in the absence of antibiotic. The inhibitory effectiveness of each antibiotic on the growth of the bacteria is then computed from the substantially simultaneous readings and printed out. The bacterial/broth suspension samples are conveniently deposited in a disposable, plastic, transparent, compartmented container or cuvette into which antibiotic discs are introduced into all but one compartment (chamber) from a ganged disc dispenser. After a brief agitated incubation period of about three hours, the covette is inserted in a photometric analyzer which measures the intensity of light scattered at some angle to the incident beam by each sample chamber and compares it with the light scattered at the same angle by the control chamber to which no antibiotic has been added. The relative effectiveness of each antibiotic is computed and recorded to determine which of the antibiotics is most suitable for treating the patient. The partitioned cuvette includes a filling reservoir from which the inoculated broth is introduced as equal volume aliquots into the interconnected lobes of a row of double lobed chambers. Rotation of the partitioned cuvette transfers the equal volumes of broth inoculum from the interconnected lobes to the transparent and separated lobes of the chambers. Then different antibiotic discs are simultaneously dropped within apertured tubes which are located within all chambers except the control chamber. Elution of the antibiotics into the liquid samples begins immediately. The cuvette is then placed in an incubator/shaker for approximately 3 hours at approximately 36℃ to promote bacterial growth and antibiotic elution. The light scattering readings are obtained at the end of the agitation/incubation period and the relative antibiotic effectiveness computed in an analyzer into which the cuvette is inserted and indexed past a light source. The light passes through a lens system which directs a beam of light successively through the transparent lobes of the cuvette. The readings are obtained at a predetermined angle of scatter of, for example, 35°. Initial analog signals are converted to binary digits and logarithms to simplify normalization of the antibiotic-mediated inhibition of bacterial growth by the total growth in the control chamber. The normalized growth inhibition values are printed out and rated on a scale of 0 (no inhibition, total resistance) to 100 (complete inhibition, total susceptibility). In addition the total growth, which has oc-

curred in the control chamber during the agitation/incubation period, is printed out as a logarithmic difference (growth index).

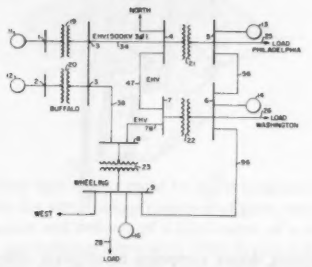
If insufficient growth has occurred in the control chamber (growth index less than 0.9), the cuvette may be reincubated and reread before disposal.

3,832,533

ON-LINE HYBRID COMPUTER ARRANGEMENTS HAVING UNIVERSAL INTERFACING CAPABILITY FOR ELECTRIC POWER SYSTEM STUDIES

Norman R. Carlson, Export, and Uri G. Ronnen, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 19, 1972, Ser. No. 254,858
Int. Cl. G06j *1/00*; G06f *15/06, 15/56*
U.S. Cl. 235—151.21 9 Claims



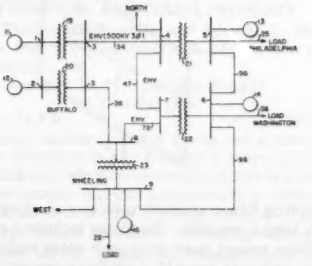
Hybrid computer arrangements for electric power system simulation and study include a modularized analog network simulator and a digital computer which may be interfaced through a data link to a remote digital computer for transmission of electric power system network variables. The electric power system is modulated by the analog simulator which includes modular circuits representative of power system components. With use of the input data to the digital computer, the computer and analog simulator are capable of operating to generate loadflow solutions and perform transient stability studies.

3,832,534

COMPUTATION OF POWER SYSTEM LOAD FLOWS AND TRANSIENT STABILITY

Norman R. Carlson, Export; William E. Zitelli, Pittsburgh, and Victor Burtnyk, Monroeville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 19, 1972, Ser. No. 255,167
Int. Cl. G06j *1/00*; G06f *15/06, 15/56*
U.S. Cl. 235—151.21 6 Claims



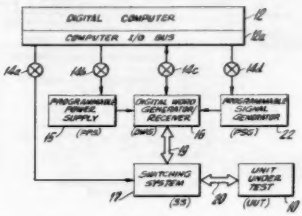
A loadflow calculator having transient stability analysis capability includes a plurality of operational amplifier DC circuits for simulation of an electric power system. The calculator responds to signals representative of predetermined network variables to produce output signals representative of AC network parameters to attain loadflow solutions and provide signal parameters for transient stability studies after one or more transient faults have been imposed on the D.C. circuits.

3,832,535

DIGITAL WORD GENERATING AND RECEIVING APPARATUS

Louis De Vito, Jersey City, N.J., assignor to Instrumentation Engineering, Inc., Franklin Lakes, N.J.

Filed Oct. 25, 1972, Ser. No. 300,536
Int. Cl. G06f *15/20*
U.S. Cl. 235—153 AC 34 Claims



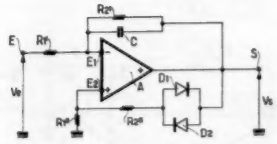
Apparatus for generating and receiving, for analysis, multibit digital words applied to or received from an electronic circuit under test in response to a computer command. A multibit data register capable of being loaded with data from the computer is controlled by a variable frequency clock signal to apply bits of the data pattern to the circuit under test. In the receive mode, the data bits are applied to a logic comparator which receives also signals from the unit under test, and any discrepancies in the incoming signal pattern or level are stored in an error register for later readout.

3,832,536

INTEGRATOR CIRCUIT

Claude Le Dily, Villemoisson-sur-Orge, and Dominique Lajotte, Paris, both of France, assignors to Compagnie Industrielle Des Telecommunications Cit-Alcatel, Paris, France

Filed Sept. 27, 1972, Ser. No. 292,781
Claims priority, application France, Sept. 27, 1971, 71.34681
Int. Cl. G06g *7/18*
U.S. Cl. 235—183 4 Claims

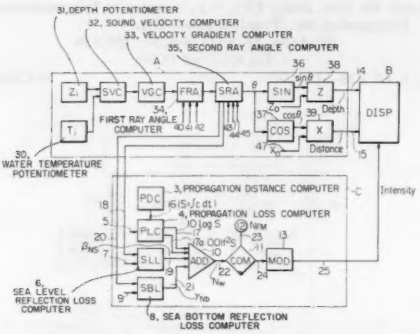


Integrator comprising an operational amplifier having an input (E1)(−) and an input (E2)(+), and an output (S), with a resistance having a value of (R1) connected up between the input (E2) and the earth, a capacitor shunted by a resistor having an ohmic value of (R2) between the output (S) and the ihput (E1), the input voltage being applied to the input (E1) through a resistor having a value of R1), characterized in that the output (S) is connected up to the input (E2) by a network comprising two diodes connected up head to tail in parallel, in series with a resistor having an ohmic value equal to (R2).

3,832,537
METHOD AND APPARATUS FOR COMPUTING AND DISPLAYING SOUND RAYS OF A SONAR SYSTEM

Yasumasa Marutani, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1973, Ser. No. 390,681
Claims priority, application Japan, Sept. 5, 1972, 47-88388
Int. Cl. G06g 7/12
U.S. Cl. 235—193 7 Claims

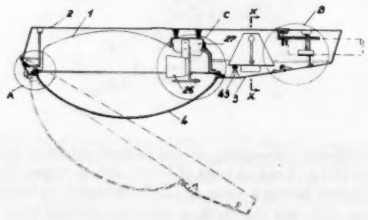


A method and apparatus for analyzing sound ray paths of a sonar system by an analog computing method is disclosed wherein the transmission loss (Nw) of a sound wave is compared with the value of a figure of merit (N_{FM}) of the sonar system. Sound rays within the detection range of the sonar system are displayed by solid lines while sound rays out of the detection range are displayed by broken lines. Thus ray paths and detection ranges of the sonar system are displayed at the same time.

3,832,538
LIGHTING FIXTURE HAVING A LAMP SUPPORT INDEPENDENT OF THE REFLECTOR

Marie Henri Hubert Adam, Lorey-Par-Bayon, France, assignor to Societe Anonyme l'Eclairage Technique, Nancy (Meurthe et Moselle), France

Division of Ser. No. 219,740, Jan. 21, 1972. This application Mar. 8, 1973, Ser. No. 339,273
Claims priority, application France, Oct. 1, 1971, 71.35397
Int. Cl. F21s 13/10, 1/10
U.S. Cl. 240—25 1 Claim

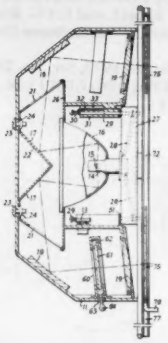


The present invention is to a light fixture having a body with detachable reflector therein and a lamp supporting socket independent of said reflector.

3,832,539
MULTI-BEAM LIGHTING DEVICE

John Anderson Oram, Osborne Cottage, Heath Rd., Leighton Buzzard, Bedfordshire, England

Continuation of Ser. No. 185,493, Oct. 1, 1971, abandoned.
This application May 11, 1973, Ser. No. 359,374
Claims priority, application Great Britain, Oct. 7, 1970, 47754/70; Dec. 15, 1970, 59566/70
Int. Cl. F21v 13/04
U.S. Cl. 240—41.3 27 Claims

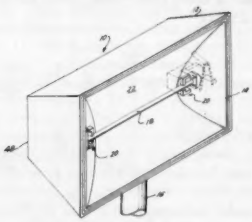


A lighting device comprises an elliptical reflector with a holder for locating a lamp with its filament at one of the foci of the reflector. A beam splitting device in the form of two planar mirrors is arranged between the reflector and its other focus to reflect two beams of light from the lamp transversely of the axis of the reflector in opposite directions. Two optical systems comprising concave mirrors and converging lenses are located in the paths of the two beams respectively to reflect the beams so that they meet at an acute angle to one another and to form focussed images of the lamp filament at the place where the beams meet.

3,832,540
LAMP MOUNTING FOR HIGH INTENSITY LIGHT FIXTURE

Charles Roth, Glen Gardner, N.J., assignor to Keene Corporation, New York, N.Y.

Filed Apr. 13, 1973, Ser. No. 350,768
Int. Cl. H05b 33/02
U.S. Cl. 240—51.11 R 4 Claims



A lighting fixture adapted to receive an elongated high intensity lamp is provided. The fixture includes a pair of socket assemblies spaced apart from each other within the fixture housing with each assembly including a ceramic socket housing adapted to nest in a base of material of high thermal conductivity. The ceramic housing is maintained in position by a

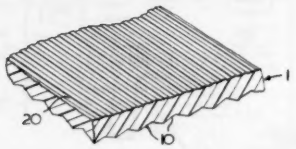
spring which also urges the housing toward the other socket assembly to provide the necessary secure electrical connections between the sockets and the ends of the lamp which comprise the lamp terminals.

3,832,541

LIGHT CONTROL DEVICE

Marion Geraldine Currie Bassett, Upper Canada College, Toronto 195, Ontario, and Alfred Thorburn Orr, 59 Astley Ave., Toronto 287, Ontario, Canada

Filed Sept. 11, 1972, Ser. No. 287,850
Claims priority, application Canada, July 24, 1972, 147758
Int. Cl. F21v 5/00
U.S. Cl. 240—106 R **12 Claims**



A decorative light control panel for use in conjunction with a light source for simultaneous reduction of glare, masking of the light source and delivery of a light output of a uniform brightness, comprising a transparent sheet having a first surface to receive the incident light from a light source and a second surface opposite to said first surface to emit the light received; said first surface composed of a plurality of spaced light diffusing areas having means to diffuse light incident upon them from the said light source and a plurality of alternating clear light transmitting areas permitting the remaining portions of the incident light to pass through said transparent sheet unimpeded; the light diffusing and light transmitting areas of the said first surface being arranged in decorative patterns; said second surface provided with arrays of light refractive means; the two opposite said surfaces forming with said transparent sheet an integral unit.

The means to diffuse and the means to transmit directly, of the first surface preferably, but not necessarily, are arranged in symmetrical alternating configurations of parallel lines, dots and/or patterns.

The refractive means of the second surface preferably are arrays of lenses, prisms and their combinations and are not necessarily correlated in their patterns with the patterns of the areas of the first surface.

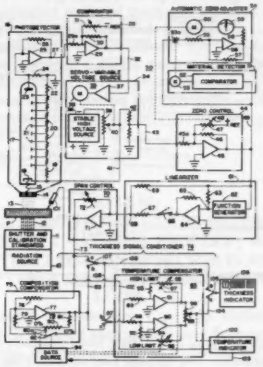
3,832,542

WIDE RANGE RADIATION GAGE HAVING A CONTROLLED-GAIN PHOTODETECTOR FOR DETERMINING A MATERIAL PROPERTY

William G. Bartlett, Stockertown, and Edmund L. Mangan, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed June 22, 1972, Ser. No. 265,415
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 R **30 Claims**

A high energy nuclear radiation source and a scintillation detector are combined to gate a material property, such as steel plate thickness, when the material is placed in a beam of radiation. The detector includes a photomultiplier tube which operates in a servo loop with a voltage controlled variable dynode voltage source, the latter controlling tube gain to maintain anode current substantially constant over a wide range of gaging. Gage operation is based on the phenomena of a non-linear photomultiplier tube gain characteristic being inverse and nearly equal to the nonlinear radiation absorption characteristic of the material being gaged. This yields a dynode voltage which varies only slightly nonlinearly as a measure of the material property. The gage includes a linearizer for correcting the nonlinearity of a fraction of the dynode voltage and this signal is ultimately applied to a material property indicator. Also included is an automatic zero adjuster for continuously providing a zero-based gaging signal under variable operating conditions, and a material presence/absence detector for casuing the zero adjuster to act only during the absence of material from the gage. In addition, a signal conditioner modifies the linearized signal to compensate for variations in other material properties which affect the gaging property.

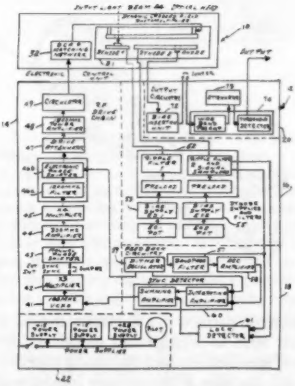


3,832,543

GATED DETECTOR SYNCHRONIZATION

Samuel I. Green, Creve Couer, and Douglas W. Dreisewerd, Florissant, both of Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 4, 1973, Ser. No. 366,837
Int. Cl. H04b 9/00
U.S. Cl. 250—199 **3 Claims**

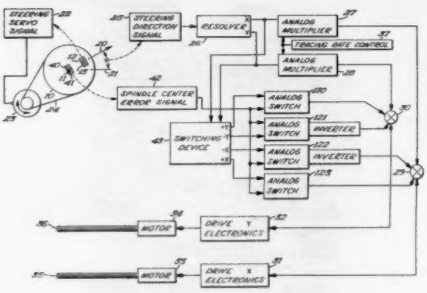


An optical pulse detector apparatus providing remote synchronization of the frequency and phase of the R. F. gate drive signal to the modulated optical input pulse train.

3,832,544
LINE TRACING APPARATUS

Arney Landy, Jr., St. Paul, Minn., assignor to Andrew Engineering Company, Hopkins, Minn.

Filed Mar. 22, 1973, Ser. No. 343,858
Int. Cl. G05b 1/00
U.S. Cl. 250—202 15 Claims

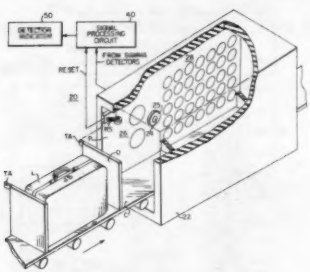


A line tracer having a scanning head optically connected to a rotatable spindle. The spindle carries a first set of photosensitive elements at a location spaced from its rotation axis for the purpose of orienting the spindle to a "direction" indicative of the direction of a line portion being viewed by the scanning head. A second set of photosensitive elements is carried by the rotating spindle at its axis of rotation for generating an error signal. A signal representing the orientation of the rotating spindle is combined with the error signal thereby providing accurate control over the scanning head.

3,832,545
NUCLEAR TECHNIQUES FOR DETECTING THE PRESENCE OF EXPLOSIVES

John Bartko, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 28, 1972, Ser. No. 290,901
Int. Cl. G01t 1/203; G01j 39/18
U.S. Cl. 250—312 21 Claims

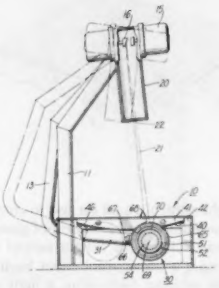


The invention pertains to a nuclear technique for monitoring objects such as luggage and parcels to determine the presence of specified nitrogen containing materials such as explosives as a function of the nitrogen content and concentration profile. Objects to be analyzed to determine the presence of nitrogen are subjected to a thermal neutron environment and the gamma ray radiation produced by the object in response to nitrogen reactions is monitored by gamma ray detectors. The gamma ray detectors produce indications of the nitrogen content of the object and the concentration profile of the nitrogen in the object. The information provided by the gamma ray detectors is processed to determine if the measured nitrogen content and concentration corresponds to a class of nitrogen containing material of interest, i.e. explosives.

3,832,546
X-RAY SYSTEM WITH ALIGNED SOURCE AND SLITS

Arthur Lee Morsell, Tarzana, and Norton L. Moise, Los Angeles, both of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Division of Ser. No. 243,982, April 14, 1972, Pat. No. 3,766,345. This application Mar. 7, 1973, Ser. No. 338,763
Int. Cl. H05g 1/00
U.S. Cl. 250—315 4 Claims

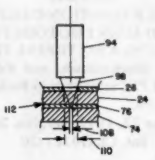


An X-ray system for producing a fan-shaped beam and scanning the beam over the object to be X-rayed for reducing fogging due to scattering and reducing exposure of the patient. A cassette for holding the record medium in a gas filled gap between electrodes, and a mechanism for rotating the record medium past a slit in synchronism with the X-ray beam scan.

3,832,547
APPARATUS FOR TRANSFERRING A UNIQUE MICROPATTERN OF MICROPERFORATIONS IN A FIRST METAL LAYER TO AN UNDERLYING SECOND METAL LAYER

Daniel Silverman, 5969 S. Birmingham, Tulsa, Okla. 74105

Continuation of Ser. No. 60,399, Aug. 3, 1970, abandoned. This application June 13, 1972, Ser. No. 262,290
Int. Cl. G01d 15/10
U.S. Cl. 250—319 21 Claims



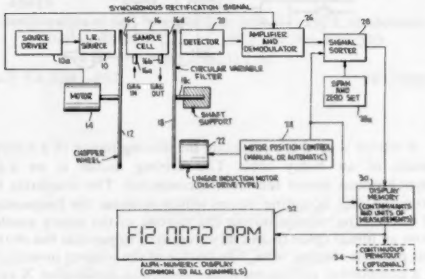
In the field of the storage and retrieval of information, information records in the form of patterns of microspots of small size and high packing density are formed on a record web by the use of a focussed first laser beam, of a first level of intensity, to evaporate or burn away material to form microperforations in a thin layer of opaque first material on a web of transparent plastic. This invention covers the process of preparing a facsimile record of the pattern of microspots on a master

record by exposing a second record web through the microperforations to a focussed second laser beam of less intensity than the first level of intensity.

3,832,548
GAS DETECTOR UNIT

Stanley Wallack, Jackson Heights, N.Y., assignor to Oceanetics, Inc., Port Washington, N.Y.

Filed Oct. 18, 1972, Ser. No. 298,638
Int. Cl. G01n *21/34*
U.S. Cl. 250—343 **10 Claims**

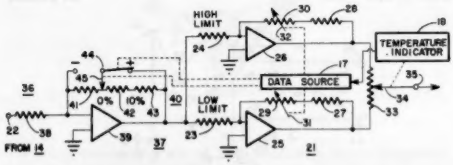


An infrared detector for detecting and quantitatively measuring a plurality of select gases in a gaseous medium which includes an infrared (IR) source; a sample cell, continuous or segmented filter means which selectively passes IR waves of the near and intermediate region at varying positions which correspond to a predetermined gas; detector means; means for moving said filter means in conjunction with said sample cell and detector means, and read-out means for each of said gases is described. The described device is compact, utilizes relatively few components, is simple and economical to operate, while providing rapid and accurate readings of the concentration of each of the plurality of gases. The qualitative and quantitative monitoring of gases can be selectively applied to any IR absorbing gas in combination with any other IR absorbing gas.

3,832,549
SIGNAL CONDITIONER APPARATUS FOR COMPENSATING AN ELECTRONIC MATERIAL GAGING SIGNAL

Edmund L. Mangan, Bethlehem, and William G. Bartlett, Stockertown, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed June 22, 1972, Ser. No. 265,110
Int. Cl. G01n *23/00*
U.S. Cl. 250—358 **20 Claims**

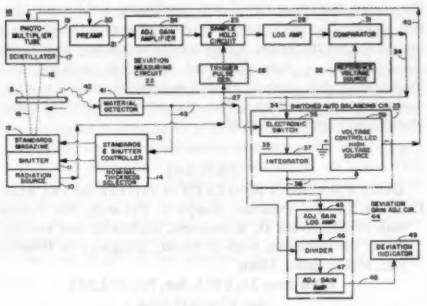


Signal conditioner apparatus multiplies electronic material gaging signal by one or more predetermined variable scaling factors to compensate for variations in other material properties which affect the gaged property. For example, material thickness gaging signal variations caused by material temperature variations are compensated for by simultaneously feeding the thickness signals through two adjustable-gain amplifiers preset at separate values which establish an adjustable range of temperature compensation. Amplifier outputs are proportioned in response to a material temperature measurement made during material gaging, thereby providing a single temperature compensated material thickness signal at an output. Material composition compensation is provided in combination with temperature compensation by first feeding the thickness signal through a single presettable-gain amplifier. All amplifier gains are preset or controlled from a data source which correlates compensation requirements with temperature and composition effects on material thickness gaging.

3,832,550
WIDE-RANGE RADIATION GAGE FOR DETERMINING DEVIATION OF A MATERIAL PROPERTY WITH A CONTROLLED-GAIN DETECTOR IN AN INTERRUPTABLE SELF-BALANCING MEASURING LOOP

William G. Bartlett, Stockertown; Carvel D. Hoffman, Allentown; Duane T. Jones, Coopersburg, and Edmund L. Mangan, Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa., by said Jones

Filed June 22, 1972, Ser. No. 265,112
Int. Cl. G01j *39/18*
U.S. Cl. 250—358 **9 Claims**

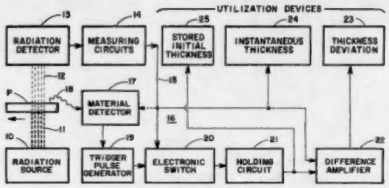


Deviation of a gaged material property, such as material thickness, density, or weight-per-unit area, from a nominal value in a wide range of values is determined by a single-range, penetrative-beam type of radiation gage having an interruptable self-balancing measuring loop that includes a controlled-gain detector, thereby providing the radiation gage with a continuously variable gain characteristic. Any nominal value of material gaging property may be pre-established in a wide range of values by inserting digital material standards from a built-in magazine into the radiation beam, thereby causing the self-balancing loop to balance at a corresponding point in the variable sensitivity range. The presence of material to be gaged is detected before entering the radiation beam and interrupts and holds the self-balancing loop at the preset nominal value, while also removing the standards from the radiation beam. Subsequent measuring signals, together with a nominal value signal, are processed in a deviation gain adjusting circuit, whereby a linear deviation signal throughout the entire variable gain range is produced and fed to a deviation indicator.

3,832,551
RADIATION GAGE WITH SAMPLE AND HOLD FEATURE IN DEVIATION MEASURING CIRCUIT

William G. Bartlett, Stockertown, and Edmund L. Mangan, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed June 22, 1972, Ser. No. 265,140
Int. Cl. G01n 23/02
U.S. Cl. 250—359 7 Claims

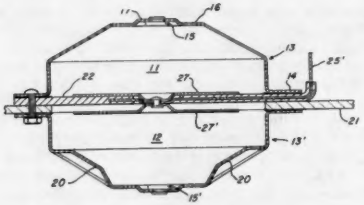


Utility of a radiation gage having a direct-reading measuring circuit for determining a material property, such as thickness, density, or weight-per-unit area, is extended by use of a thickness deviation measuring circuit arrangement. In a thickness deviation gage, for example, the latter circuit arrangement includes a sample-and-hold circuit for automatically storing an initial thickness signal detected when the material first enters the gage, and a difference amplifier for comparing instantaneous or subsequent thickness signals with the stored thickness signal and producing a thickness deviation signal. The thickness deviation signal plus the stored and instantaneous thickness signals are fed separately to utilization devices such as indicators and recorders as used in the thickness profile analysis of said material from end-to-end, or said thickness deviation signals may provide a control signal in an automatic control system.

3,832,552
DUAL CHAMBER IONIZATION SMOKE DETECTOR

Larry D. Larsen, Palatine; Joseph C. Pekarek, Mt. Prospect, both of Ill.; Arlon D. Kompelien, Richfield, and Gerald D. Rork, Bloomington, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed June 22, 1973, Ser. No. 372,552
Int. Cl. G01f 1/18
U.S. Cl. 250—381 9 Claims

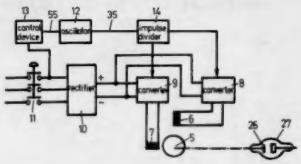


An improved chamber assembly for a dual chamber ionization smoke detector. A fluorocarbon plastic insulation member provides a non wettable insulating dividing wall between the two chambers.

3,832,553
CIRCUIT FOR A ROTARY ANODE X-RAY TUBE

Gerd Seifert, and Kurt Franke, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Elangen, Germany

Continuation-in-part of Ser. No. 192,858, Oct. 27, 1971, abandoned. This application June 12, 1973, Ser. No. 369,394
Int. Cl. H05g 1/66
U.S. Cl. 250—406 4 Claims

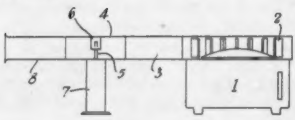


A circuit is used for actuating the driving motor of a rotary anode of an X-ray tube. The driving motor is an a.c. asynchronous motor fed from a converter. The converter is provided with actuating means which increase the frequency of the feeding voltage during the starting of the rotary anode from an initial value to an end value so as to provide the shortest possible starting time. The device of the present invention is a component part of an X-ray apparatus feeding an X-ray tube.

3,832,554
GENERATION OF NEGATIVE IONS

Charles Wilfred Topley, London, England, assignor to Armstrong Cork Company, Lancaster, Pa.

Filed June 22, 1972, Ser. No. 265,241
Int. Cl. H01j 37/00
U.S. Cl. 250—423 5 Claims

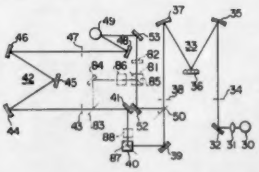


Negative ions are generated by passing a stream of gas and water vapour free of water droplets through a corona discharge of 5,000 volts or more.

3,832,555
FLUORESCENCE SPECTROPHOTOMETER

Yasushi Ohnishi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1973, Ser. No. 349,694
Int. Cl. G01t 4/6
U.S. Cl. 250—458 26 Claims



The light emitted from a light source is dispersed and monochromated through the first spectrometer unit and then

projected to a fluorescent specimen. The fluorescent light emitted from the specimen is dispersed and monochromated through the second spectromator unit and detected by a detector. Means is provided between the first spectromator unit and the specimen for deriving the light incident to the specimen and supplying the derived light and the dispersed and monochromated fluorescent light alternately to said detector so as to provide an accurate fluorescence spectrum.

3,832,556

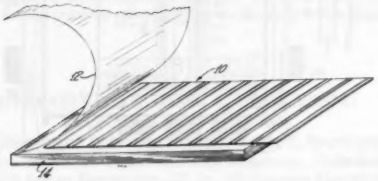
LUMINESCENT BACKING SHEET FOR WRITING IN THE DARK

Becky J. Schroeder, 2317 Valleybrook Dr., Toledo, Ohio 43615

Continuation of Ser. No. 288,148, Sept. 11, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 428,339

Int. Cl. H01j *1/62*

U.S. Cl. 250—462 **10 Claims**



A lined phosphorescent backing sheet for use in underlying relation with writing paper permitting a writer to write in orderly lined form in the dark without need for external light.

3,832,557

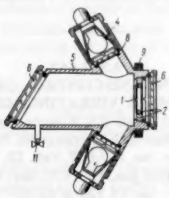
INSTRUMENT FOR VIEWING AND MEASURING ELECTROMAGNETIC RADIATION

Alexei Pavlovich Bazhulin, ulitsa Vavilova, 35, kv. 30; Evgeny Alexandrovich Vinogradov, Kozhevnicheskaya ulitsa, 16, kv. 33; Natalia Alexandrovna Irisova, ulitsa Vavilova, 44, korpus 33, kv. 74, all of Moscow; Nina Vasilievna Mitrofanova, Oktyabrskaya ulitsa, 13, kv. 42, Dolgoprudny Moskovskoi Oblasti; Jury Petrovich Timofeev, Ananievsky pereulok, 5, kv. 136, Moscow; Samuil Aronovich Fridman, Profsojiznaya ulitsa, 36/9, kv. 41, Moscow, and Valentina Vasilievna Schaenko, 2 Parkovaya ulitsa, 18, kv. 21, Moscow, all of U.S.S.R.

Filed May 9, 1972, Ser. No. 251,697

Int. Cl. H01j *1/62*

U.S. Cl. 250—461 **9 Claims**



An instrument for viewing and measuring electromagnetic radiation, wherein an image-receiving web of an image-receiving screen is formed by successively arranged layers comprising: a heat insulation backing layer, a metal layer and a luminophore layer, the image-receiving web being secured on a holder, the image-receiving screen and an excitation source are enclosed within a housing provided with windows for the passage of the electromagnetic radiation; the screen with its holder is preferably enclosed within a protective case also provided with windows for the passage of the electromagnetic radiation being measured.

3,832,558

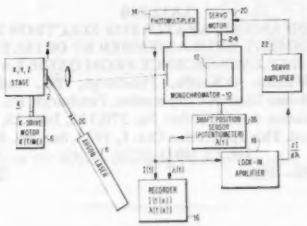
AUTOMATIC WAVELENGTH TRACKING SYSTEM

Robert E. Fern, Yonkers, N.Y., and Aare Onton, Korntal, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 20, 1973, Ser. No. 343,089

Int. Cl. G01n *21/38*

U.S. Cl. 250—461 **18 Claims**



A method and apparatus for determining the characteristics of a luminescent material using a monochromator to detect the intensity of a light emitted by the material at a single major spectral line as the material is scanned. The wavelength of a monochromator is adjusted such that the intensity being measured is the peak intensity. The fact that the intensity is the peak intensity is determined by taking the derivative of the intensity with respect to wavelength as the wavelength of the monochromator is modulated by a wavelength wobbler. The intensity is at its peak when the derivative equals zero. The derivative signal is applied to a servo loop which controls the wavelength of the monochromator and varies the wavelength such that the derivative is maintained equal to zero. This technique may be used to determine the atomic proportions of material having intensity and/or wavelength related to its composition, to define areas of a material having particular characteristics, to evaluate a piece of material, or to determine the line shape of the spectral curve at a point on the material.

3,832,559

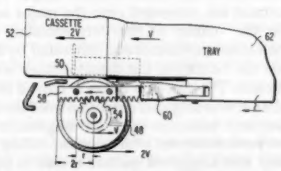
CASSETTE LOAD AND EJECT MECHANISM FOR SPOT-FILM APPARATUS

Eugene P. Thomas; Henry F. Cimildora, and James A. Morin, all of Baltimore, Md., assignors to CGR Medical Corporation, Baltimore, Md.

Filed Apr. 3, 1973, Ser. No. 347,429

Int. Cl. G01n *21/34*

U.S. Cl. 250—468 **13 Claims**



A pair of friction wheel mechanisms adapted to engage the forward portion of respective sides of an X-ray film cassette

and which uses the forward motion of the cassette tray as a driving force to eject the cassette automatically. A rack and pinion gear associated with each friction wheel are actuated by driver elements located on each side of the cassette tray. Each friction wheel and associated pinion gear rotate on a common axis and are integral with one another. The diameter of the friction wheel is selectively greater than the diameter of the pinion gear such that when the cassette tray drives the rack and pinion gear arrangement, the friction wheel will cause the linear velocity of the cassette to be greater than the linear velocity of the cassette tray by the ratio of the relative diameters of the pinion gears and friction wheel.

3,832,560

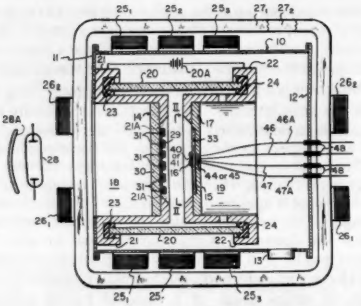
METHOD AND APPARATUS FOR ELECTRON BEAM ALIGNMENT WITH A MEMBER BY DETECTING CATHODOLUMINESCENCE FROM OXIDE LAYERS

Terence William O'Keeffe, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 370,115, June 13, 1973, abandoned. This application Oct. 1, 1973, Ser. No. 402,249

Int. Cl. H01j *29/50, 31/49*

U.S. Cl. 250—492 **22 Claims**



A method and apparatus are provided for alignment of an electron beam with precisely located areas of a major surface of a semiconductor member. At least one and preferably two spaced apart detector marks of predetermined shape formed by cathodoluminescent oxide layers are positioned adjacent the major surface. Each detector mark provides a differential in cathodoluminescence projected by the oxide layer corresponding to the area of the mark irradiated by an electron beam. To align, an electron beam to be aligned has at least one alignment beam portion corresponding to at least one detector mark and of predetermined cross-sectional shape. The alignment beam portions are projected onto the major surface of the member in the vicinity of the corresponding detector marks. And the cathodoluminescence generated by the oxide layers in at least the vicinity of the detector mark is detected by detecting means. The electron beam is moved relative to the member while continuing said detection until the detected cathodoluminescence indicates optimum alignment of each alignment beam portion thereof with a corresponding detector mark. Preferably, said alignment method is used in producing a very accurate component pattern in electroresist layer on the major surface of the member with either a scanning electron beam or a patterned electron beam generated by a photocathode source.

3,832,561

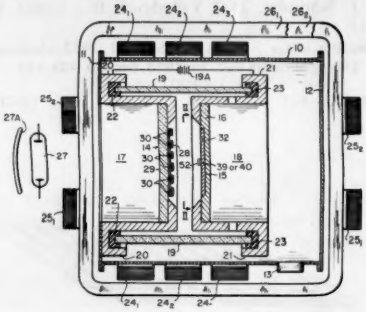
METHOD AND APPARATUS FOR ELECTRON BEAM ALIGNMENT WITH A SUBSTRATE BY SCHOTTKY BARRIER CONTACTS

Terence W. O'Keeffe, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 1, 1973, Ser. No. 402,239

Int. Cl. H01j *37/26*

U.S. Cl. 250—492 **21 Claims**



A method and apparatus are provided for precision alignment of an electron beam with selected areas of a major surface of a substrate. At least one and preferably two spaced apart detector marks of predetermined shape formed by Schottky barrier contacts are provided adjacent the major surface of the substrate. To align, an electron beam to be aligned has at least one alignment beam portion corresponding to at least one Schottky barrier contact detector mark and of predetermined cross-sectional shape. The electron beam is projected onto the major surface with the alignment beam portions thereof in the vicinity of corresponding Schottky barrier detector marks. An electrical signal is produced by each irradiated Schottky barrier contact corresponding to the area of the detector mark irradiated by an alignment beam portion. The electron beam is moved relative to the substrate to vary the electrical signal and is positioned where the electrical signal indicates optimum alignment of each alignment beam portion with a corresponding Schottky barrier detector mark. The method and apparatus is particularly suited for use in producing a very accurate component pattern in an electroresist layer on the major surface of the substrate with a patterned electron beam generated by a photocathode source.

3,832,562

ENHANCEMENT AND CONTROL OF RADIATION BEAMS BY VIBRATING MEDIA

Alan M. Jacobs, and Edward S. Kenney, both of State College, Pa., assignors to Research Corporation, New York, N.Y.

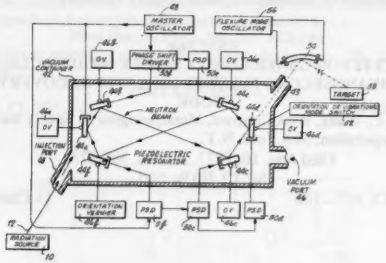
Continuation of Ser. No. 117,647, Feb. 22, 1971, abandoned. This application Jan. 15, 1973, Ser. No. 323,794

Int. Cl. G01n *23/20*

U.S. Cl. 250—503 **25 Claims**

Disclosed are apparatus and methods for controlling radiation, such as a beam of neutrons, low energy gamma rays, X-rays, or electrons, by means of successive diffractions by diffracting media, such as crystals, vibrating in a compression mode in a shear mode or in a complex superimposed vibrational mode. The radiation beam may be subjected to successive diffractions by an arrangement of such vibrating diffracting media and may thus be contained in a substantially closed

path such as a hexagonal path or a figure-eight path. Alternatively, the radiation beam may be subjected to one or more



diffractions by an arrangement of such vibrating diffracting media for the purpose of controlling the beam in a non-closed path.

3,832,563

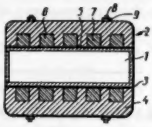
APPARATUS FOR STORING AND PROCESSING FISSIONABLE SUBSTANCES

Boris Grigorievich Dubovsky, Kaluzhskoi oblasti, Sportivnaya, 5, kv. 6; Viktor Konstantinovich Bogatyrev, Kaluzhskoi oblasti, bulvar Entuziastov, 27, kv. 52; German Matveevich Vladykov, Kaluzhskoi oblasti, ulitsa Kosmonavtov, 7a, kv. 23, and Valentina Yakovlevna Sviridenko, Kaluzhskoi oblasti, 44, kv. 71 ulitsa Lenina, all of Obninsk, U.S.S.R.

Filed Aug. 7, 1972, Ser. No. 278,655

Int. Cl. G21f *1/00*

U.S. Cl. 250—506 **24 Claims**



An apparatus for storing and processing fissionable substances provided with a protective shield. The latter consists of a layer of a neutron-absorbing material, followed by a layer of a neutron-retarding material. The layer of a neutron-absorbing material is located in a direct proximity to a vessel with a fissionable substance contained therein. The layer of a neutron-retarding material is made with alternating projections and depressions facing the layer of a neutron-absorbing material.

3,832,564

RADIATION ABSORBER AND INTENSITY COLLIMATOR UNIT

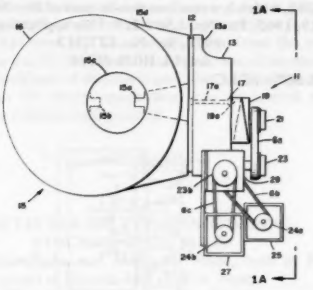
Leland S. Hall, Twain-Harte, and Howard Heffan, Concord, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1973, Ser. No. 328,206

Int. Cl. G21f *5/02*

U.S. Cl. 250—510 **10 Claims**

A radiation absorber which automatically and/or digitally controls the intensity of a radiation source by providing an absorbent measured fixed path for the radiation beam to travel, by the use of a cylindrical helically shaped step wedge to control the intensity of the radiation emitted from the radiation source. By changing the angle of cylindrical shaped step wedge, the thickness of the material in the path of the beam



emitted from the source changes, thereby changing the flux of the beam.

3,832,565

HOLOGRAPHIC MEMORY WITH DODECAHEDRON DETECTOR MATRIX

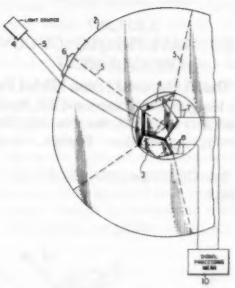
Peter Graf, and Manfred Lang, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 14, 1973, Ser. No. 359,846

Claims priority, application Germany, May 18, 1972, 2224350

Int. Cl. H01l *15/00*; G02b *27/00*

U.S. Cl. 250—566 **1 Claim**



A device for retrieving information stored in the form of sub-holograms on a storage medium comprising a light source, means for holding the storage medium and a detector matrix characterized by the detector matrix comprising a plurality of plane detector matrices each of which has an array of light detectors and the matrices are arranged with the plane surfaces of adjacent matrices forming an angle so that each of the matrices is assigned to receive information retrieved from a portion of the storage medium. The detector matrices may have a polygon surface such as a pentagon and are arranged to form a single polyhedral detector mattix such as a detector matrix consisting of a semi-dodecahedron.

3,832,566

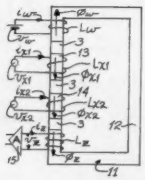
DISTORTIONLESS MAGNETIC LOGIC ELEMENTS

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Division of Ser. No. 840,121, June 19, 1969, Pat. No. 3,651,282, which is a continuation-in-part of Ser. No. 599,335, July 19, 1965, Pat. No. 3,504,229. This application Mar. 23, 1971, Ser. No. 127,313

Int. Cl. H03k 19/16

U.S. Cl. 307—88 LC 20 Claims



The principles and use of magnetic main core flux and ways for eliminating mutual flux components contributing to distortion in a group of magnetic devices results in these magnetic devices having better operating results and hence contributes to better and higher fidelity products. Included are components such as logic gates. A basic ternary or three-state logic element is disclosed with distortion-free properties and its use in computer applications enables a large reduction of the number of logic gates along with faster computation time in view of the fact that counting is done by three instead of the conventional two in digital computers. The freedom from distortion in the logic gates enhances pulse handling ability, reduces the quantity of wave shape restoration components needed in equipment wherever used, and enables a greater amount of information to be stored in a smaller amount of space on a recording medium in view of the freedom from distortion components, which actually use up a large portion of the frequency spectrum and hence recording space.

3,832,567

TRAVELLING WAVE FREQUENCY CONVERTER ARRANGEMENT

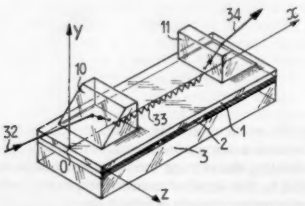
Andre Jacques; Daniel Ostrowsky, and Michel Papuchon, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed July 20, 1973, Ser. No. 381,094

Claims priority, application France, July 26, 1972, 72.26711

Int. Cl. H02m 5/04; G02f 1/28

U.S. Cl. 307—88.3 9 Claims



The present invention relates to travelling wave frequency converter arrangements based on the harmonic generation. The converter in accordance with the invention comprises a harmonic generation interface obtained by bringing together a metal film and an optical waveguide layer whose thickness is such that the phase velocities of the fundamental and harmonic frequency radiations transmitted are substantially matched with one another. Optical coupling means are associated with the optical waveguide and electrical means may be provided for altering the phase velocity matching.

3,832,568

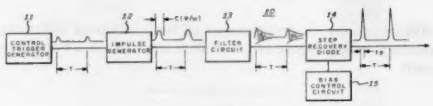
CIRCUIT FOR GENERATING A SINGLE HIGH VOLTAGE SUBNANOSECOND PULSE FROM A STEP RECOVERY DIODE

Chao C. Wang, West Concord, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 10, 1973, Ser. No. 387,573

Int. Cl. H03k 3/00

U.S. Cl. 307—106 15 Claims



A series connected electronic circuit including in combination a trigger generator, an impulse generator, a filter circuit having an inductance L, a step recovery diode having a forward resistance R_F and a reverse capacitance C_R and an optimal bias circuit coupled to the step recovery diode. The trigger generator produces a train of pulses having a relatively long time interval, T, between each pulse; these pulses are then coupled to the impulse generator which produces an impulse having a Fourier component predominant at a frequency ω in response to each trigger pulse. The filter circuit converts each impulse into a damped sine wave having an angular frequency ω and a damping constant $\delta \doteq R_F/2L$. The sine wave is coupled to the step recovery diode which generates a single high voltage subnanosecond pulse having a half period, $t_p/\pi \doteq \sqrt{LC_R}$ in response to each damped sine wave.

3,832,569

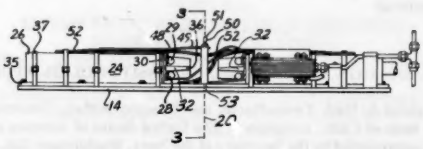
PULSE GENERATOR MODULE AND GENERATOR SYSTEM

Robert L. Anderson, and Robert Darrell Stine, Jr., both of San Diego, Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Filed Aug. 22, 1972, Ser. No. 282,717

Int. Cl. H02m 3/18

U.S. Cl. 307—110 5 Claims

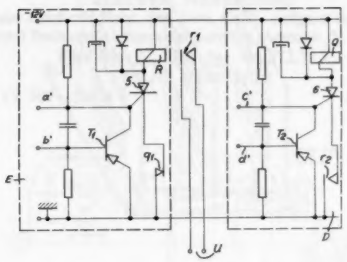


Two stage stackable modules for assembly in compact, low inductance pulse generators of the Marx type. Also disclosed are Marx generators comprising stacked arrays of such modules, and pulse generator systems comprising such Marx generators in combination with a peaking capacitance and a low inductance output switch.

3,832,570
METHOD FOR CONTROLLING AT LEAST ONE LOAD CIRCUIT AND DEVICES FOR CARRYING OUT THIS METHOD

Jean-Claude Gabus, Schilern/Koniz, Switzerland, assignor to Signale & Automatik A.G., Berne, Switzerland

Filed Dec. 5, 1972, Ser. No. 312,316
Claims priority, application Switzerland, Jan. 28, 1972, 1380/72
Int. Cl. H01h 3/16
U.S. Cl. 307—116 4 Claims

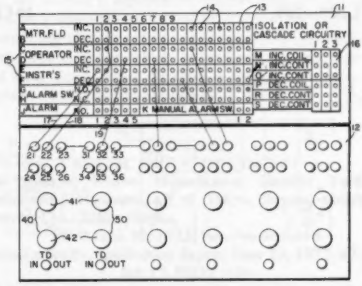


The invention concerns a method for controlling at least one load circuit, where the switching on of this load circuit is controlled by means of a control circuit actuated by at least one detector which is actuated with the tongue. The invention concerns also a control device for at least one load circuit which comprises a relay one contact of which is connected into the load circuit to be controlled and also a circuit for controlling this relay actuated by at least one humidity-sensitive detector intended to be actuated with the tongue.

3,832,571
CASCADED VARIABLE DELAY SYSTEM

Clifford Ray Grosvenor, Endwell, N.Y.; Ronald R. Resch, Laurel, Md., and Paul P. Pumm, Tonawanda, N.Y., assignors to The Singer Company, Binghamton, N.Y.

Filed Jan. 28, 1971, Ser. No. 110,463
Int. Cl. H01h 47/18; G09b 23/00
U.S. Cl. 307—154 11 Claims

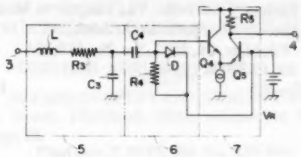


In apparatus comprising a plurality of separate units in which a change in one unit is to be initiated a prescribed interval of time after a change in another unit has terminated, this invention comprises a programmable delay mechanism for rendering such changes automatic. A plurality of selectively settable timing devices are provided in pairs. In each pair, one such timing device is set by the termination of a change in one unit. After the elapse of the interval selected for the timing device, an output is generated which sets the second device of the pair. When the second device of a pair is set, it generates an output signal which exists for the length of time for which that device has been set. The output signal from the second timing device can be used to initiate the action of another pair of devices. Each pair of devices is provided with input and output terminals for ready connection into an overall timing system of any desired configuration.

3,832,572
CIRCUIT FOR DELAYING AND SHAPING SYNCHRONIZING PULSE

Shigeaki Minamihata, and Masayasu Niimi, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 7, 1973, Ser. No. 386,404
Claims priority, application Japan, Aug. 9, 1972, 47-79138
Int. Cl. H03k 3/00
U.S. Cl. 307—106 3 Claims



A synchronizing pulse delaying and shaping circuit includes an integration circuit, a clamping circuit, a differential amplifier and a reference power source. The clamping circuit includes a coupling capacitor and a diode. A synchronizing pulse is applied to the integration circuit, to be shaped into an integrated waveform. The intergrated signal has its DC component blocked by the coupling capacitor, and the resultant signal is superimposed on a reference voltage of the reference power source. The superimposed signal is partially clamped by the diode and the reference power source. Current flows through the diode in the forward direction, with the result that the coupling capacitor is discharged. When the peak level of the clamped signal is thus lowered to a predetermined value, the clamped signal voltage is compared with the reference voltage by the differential amplifier. Then, an output pulse is provided.

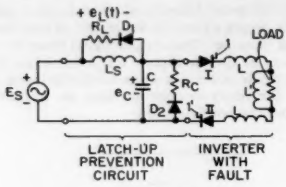
3,832,573
OVER-CURRENT LATCH-UP PROTECTION APPARATUS FOR SCR INVERTER CIRCUITS AND THE LIKE

Peter Ver Planck, Newton, and Paul R. Johannessen, Lexington, both of Mass., assignors to Megapulse Incorporated, Bedford, Mass.

Filed Feb. 15, 1973, Ser. No. 332,667
Int. Cl. H02h 7/14
U.S. Cl. 307—202 5 Claims

This disclosure deals with over-current latch-up protection apparatus for SCR inverter circuits and the like, wherein an L-C network of frequency substantially lower than the inverter output frequency is interposed between the D. C. supply and

the inverter to discharge through a short-circuiting inverter fault in such a way that the inverter's supply voltage is momentarily reversed, enabling the recovery of the SCRs to their non-conductive state, without over-current damage.

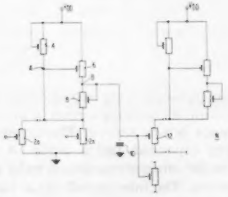


3,832,574

FAST INSULATED GATE FIELD EFFECT TRANSISTOR CIRCUIT USING MULTIPLE THRESHOLD TECHNOLOGY

Gerald W. Leehan, Centreville, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,255
Int. Cl. H03k *19/08, 19/34;* **H01l** *19/00*
U.S. Cl. 307—205 **12 Claims**



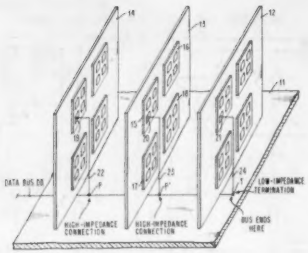
An integrated logic circuit using FETs having different threshold characteristics to assure that the FETs having the lower threshold voltage turn ON before those having a high threshold voltage when their gates are connected to a common node. Thus it is possible to use a low threshold FET diode as a series element in the discharge path between the logic output node of a conventional NOR circuit and its load. This diode isolates the conventional NOR from the interconnection capacitance, thus eliminating the effect of the interconnection capacitance on rising transitions at the logic output node. Furthermore, since low threshold devices can exist within the same circuit as the necessarily high threshold input FETs, two lower threshold FETs can be connected in series such that the input capacitance of a succeeding stage can be charged to a logic 1 voltage that is less than the power supply voltage by the gate to source voltage of the two lower threshold FETs. This logic 1 voltage is higher since the threshold of these two devices is lower than would be possible in single threshold technology. Also, the second of the two lower threshold FETs can serve as a charging means for the input capacitance of the succeeding stage while maintaining the isolation between that capacitance and the output of the conventional NOR circuit. Thus, multiple threshold technology can be used to reduce the effect of the interconnection capacitance of succeeding logic stages, while increasing the logic level.

3,832,575

DATA BUS TRANSMISSION LINE TERMINATION CIRCUIT

Sumit Dasgupta, Beacon; David H. Richter, Wappingers Falls, and Ted I. Takayesu, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1972, Ser. No. 319,097
Int. Cl. H03k *19/08, 5/08*
U.S. Cl. 307—208 **26 Claims**



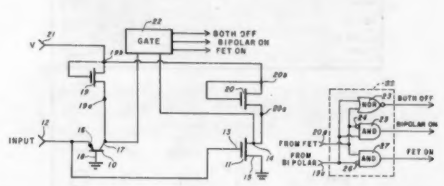
A data bus transmission line termination circuit for connection either to the terminal end of a data bus or to an intermediate portion of the bus. The circuit is programmable to either a low-impedance state for connection to the terminal end of the data bus so as to provide an optimum terminating load for the bus, or to a high-impedance state for connection to an intermediate portion of the data bus so as not to load down the latter when so connected. The termination circuit is preferably formed on the same integrated circuit chip as the receiver circuit so as to be located adjacent the effective end of the total transmission line including the portion extending from the data bus proper through the connections and conductors of the board, card, module and chip to the receiver circuit on the chip.

3,832,576

ENCODER CIRCUIT TO REDUCE PIN COUNT FOR DATA ENTRY INTO INSULATED GATE FIELD EFFECT TRANSISTOR INTEGRATED CIRCUITS

Robert J. Proebsting, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 65,839, Aug. 21, 1970, abandoned. This application June 7, 1972, Ser. No. 260,644
Int. Cl. H01l *27/02*
U.S. Cl. 307—209 **10 Claims**



An insulated gate field effect transistor compatible encoder circuit employs a field effect transistor and a lateral bipolar transistor to reduce the number of transmission lines or pins necessary to transmit information to an insulated gate field effect transistor integrated circuit employing such encoder circuit as its input. The input to the encoder circuit is coupled to

both the gate of a field effect transistor and the emitter of a bipolar transistor. When a negative voltage is transmitted to the input, the field effect transistor turns on; when a positive voltage is transmitted to the input, the bipolar transistor is turned on; and when no voltage is transmitted to the input, neither transistor is turned on. The outputs of the transistors are then gated to provide three distinct logic inputs, from the single input, for the insulated gate field effect transistor integrated circuit.

3,832,577

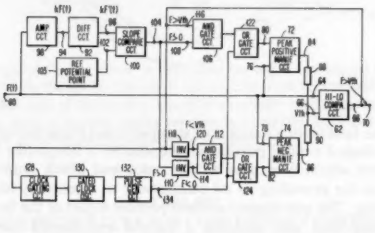
THRESHOLD EXTRACTION CIRCUITRY FOR NOISY ELECTRIC WAVEFORMS

Jerome Danforth Harr, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 22, 1973, Ser. No. 372,713

Int. Cl. H03k *5/20*

U.S. Cl. 307—235 A **15 Claims**



Significant low frequency noise components in an electric wave, likely to follow larger transient components, are accommodated by automatically adjusting threshold crossing extraction circuitry. Peak component values of each cycle of a wave are stored and used in adjusting the threshold for the succeeding cycle of that wave. The peak level of each mark signal and that of each space signal component is stored by circuitry closely tracking the pertinent changes in the wave envelope. This circuitry is automatically adjusted rapidly at the beginning of each cycle and thus provides control of threshold adjustment without delay under widely varying conditions, such as are encountered in hand scanning of bar coding and the like. Facile circuitry comprises capacitive negative and positive peak tracking and storing circuits interconnected by a resistance divider network from which the threshold value is extracted for application to a signal comparator circuit in which the threshold signal is derived. Output of the comparator circuit is applied to the tracking circuits for arming them. The input signal is differentiated for enabling the tracking and storing circuits alternately in accordance with the sign of the signal wave slope. Reset circuitry is arranged for maintaining operation within the normal range.

3,832,578

STATIC FLIP-FLOP CIRCUIT

Kosei Nomiya; Kazuo Minorikawa; Shuichi Torii, and Yoshikazu Hatsukano, all of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

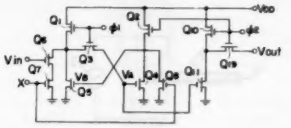
Filed June 13, 1973, Ser. No. 369,418

Claims priority, application Japan, June 28, 1972, 47-64027

Int. Cl. H03k *3/26*

U.S. Cl. 307—279 **8 Claims**

A static flip-flop circuit comprising a first inverter including a first insulated gate field-effect transistor (MIS-FET), a second inverter including a second MIS-FET and whose output is feedback-connected to the gate of the first MIS-FET, a third inverter including a third MIS-FET, the gates of the second and third MIS-FET's being interconnected, a transfer gate MIS-FET whose gate is connected to receive a first train of clock pulses, an input MIS-FET whose gate is connected to receive an input signal, a control MIS-FET which is connected in series with the input MIS-FET, the series connection being incorporated in parallel with the first MIS-FET, a further control MIS-FET which is connected in parallel with the second MIS-FET, and a reading MIS-FET which is connected to the output of the third inverter and whose gate is connected to



receive a second train of clock pulses differing in phase from the first train of clock pulses, the control MIS-FET's being connected to receive a writing control signal at their gates, the writing control signal being adapted to render the control MIS-FET's conductive when at least the transfer gate MIS-FET is conductive at writing, whereby the same information as stored in the second MIS-FET is stored in the third MIS-FET in order to be read out through the reading MIS-FET.

3,832,579

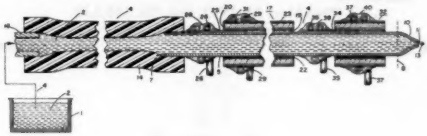
PULSED DROPLET EJECTING SYSTEM

John P. Arndt, Cleveland, Ohio, assignor to Gould Inc., Chicago, Ill.

Filed Feb. 7, 1973, Ser. No. 330,360

Int. Cl. H04r *17/00*

U.S. Cl. 310—8.1 **4 Claims**

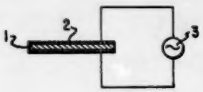


A reservoir supplies liquid through a conduit to a nozzle. The liquid is under small or zero static pressure. Surface tension at the nozzle prevents liquid flow when the system is not actuated. A section of the conduit terminating at the nozzle is designed to be capable of conducting pressure waves in the liquid from end to end of the section without the occurence of significant reflections within the section. An electroacoustic transducer is coupled to the liquid in the reflection-free section. When an electric pulse is applied to the transducer it applies a pressure pulse to the liquid sending a pressure wave to the nozzle where it causes ejection of a droplet. The pressure pulse also sends a pressure wave in the opposite direction. The system has energy absorbing means coupled to the liquid and adapted to absorb substantially all of the energy of the latter wave, thus preventing reflections which could return to the nozzle and interfere with ejection of a subsequent droplet. Two classes of energy absorbing means are described: (a) conduit walls of viscoelastic material which deform under the influence of the pressure wave and absorb energy therefrom, and (b) several forms of acoustic resistance elements within the conduit at the inlet end of the reflection-free section.

3,832,580
HIGH MOLECULAR WEIGHT, THIN FILM PIEZOELECTRIC TRANSDUCERS

Isao Yamamuro, and Masahiko Tamura, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 793,943, Jan. 27, 1969, abandoned. This application Jan. 4, 1973, Ser. No. 321,072
Int. Cl. H04r 17/00
U.S. Cl. 310—9.5 8 Claims

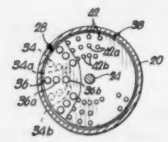


A transducer for converting electrical energy into mechanical or acoustic energy or vice versa using a converting means made of a thin film of high molecular weight polymer piezoelectric organic compound having orientated molecules and having electrodes bonded or deposited onto both surfaces thereof. When an electric current is applied to the electrodes, the thin film is extended or contracted in a direction different from the direction of orientation of the molecules. when the angle between these two directions is 45°, the extent of the extension or contraction of the thin film is at a maximum and the best converting efficiency can be obtained.

3,832,581
MULTI-ARMATURE AND CONCENTRIC MOTORS

George R. Hoffmann, P.O. 8201 Craig, Overland Park, Kans. 66204; Elmer B. Mason, P.O. 901 Vickie Dr., Oklahoma City, Okla. 73115; Graydon W. Jack, P.O. 2532 N.W. 28th, Oklahoma City, Okla., and Glenn A. Campbell, Montrose, Mo. 64770

Filed Mar. 31, 1972, Ser. No. 240,148
Int. Cl. H02k 21/38
U.S. Cl. 310—46 8 Claims

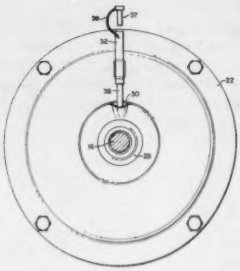


Electric motors of multi-armature and concentric design having high efficiency and special operating characteristics adapting the motors for a number of different types of applications. The multi-armature design employs two or more armatures and a common source of magnetic excitation, parallel magnetic circuits being established through the armatures to independently excite the same. In the two armature version, parallel connection of the armatures and the excitation winding causes the motor to have a dual operating characteristic in that the speed of one armature varies inversely with the speed of the other armature, and vice versa, until the higher speed armature reaches a critical rpm, whereupon the load may be increased over a wide range without further changes in the speed of either armature.

3,832,582
MOTOR WITH IMPROVED OIL SUPPLY DEVICE ON SHEET METAL ENDBELL

George M. McDonald, Ada, and Richard J. Schul, Lima, both of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 2, 1973, Ser. No. 385,196
Int. Cl. H02k 5/22
U.S. Cl. 310—90 4 Claims

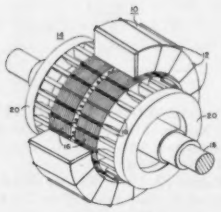


The endbell of a motor is of stamped sheet metal including a cup-shaped central portion surrounded by a flange-like outer portion which is secured to the stator and which supports a device for providing an oil passageway to a centrally located bearing. The cup-shaped endbell portion is part of the bearing housing that also includes a second cup-shaped member disposed within the first cup-shaped portion in opposite facing relation. The two cup-shaped elements have shaft receiving apertures and contain a bearing and oil retaining wicking material. One of the cup-shaped elements has an additional aperture off the shaft axis. The oiler device is a unitary member of molded plastic material; it is snap fit, without fasteners, in an aperture in the flange portion of the endbell and has an extremity in the aperture of one of the cup-shaped elements. The outer extremity of the oiler device is proximate the radial extremity of the endbell.

3,832,583
SQUIRREL CAGE MOTOR WITH IMPROVED ROTOR BAR SECURING ARRANGEMENT

Chen-Kuo Chang, Depew, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1973, Ser. No. 339,492
Int. Cl. H02k 3/04
U.S. Cl. 310—201 3 Claims



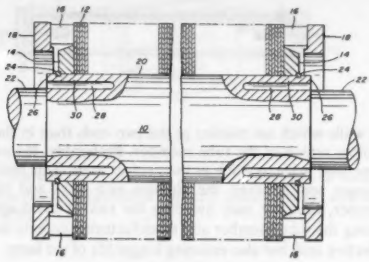
A squirrel cage motor has its rotor bars located in core slots with indentations in the slot walls into which material of the bars is forced, such as by swaging, in order to restrain the bars from vibration in use.

3,832,584

ROTOR FOR DYNAMOELECTRIC MACHINES

Alseno S. DePaul, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 7, 1974, Ser. No. 431,585
Int. Cl. H02 17/16
U.S. Cl. 310—211 4 Claims



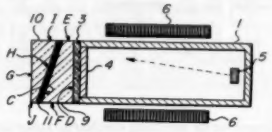
A squirrel-cage rotor is provided having a laminated core pressed on the shaft. The shaft has an undercut recess underlying each end of the core to provide a radially yieldable section of the shaft to isolate forces tending to bend the shaft and thus reduce or substantially eliminate vibration.

3,832,585

IMAGE PICKUP TUBE FOR CONVERTING COHERENT LIGHT IMAGES INTO ELECTRICAL SIGNALS

Yoshizumi Eto, and Yasunori Kanazawa, both of Hachioji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 3, 1972, Ser. No. 268,701
Claims priority, application Japan, July 16, 1971, 46-53285
Int. Cl. H01j 5/16, 29/89, 31/26
U.S. Cl. 371—477 6 Claims



An image pickup tube for transforming an image obtained by coherent light into a television signal without creating any interference fringes is provided by an optical composite which eliminates an internally generated reflected wave and includes two transparent materials with equal refractive indexes, each having one surface parallel to the image-forming surface of the image pickup tube and another surface not parallel thereto, so arranged that the surface not parallel to the image-forming surface is made optically parallel to each other by interposing therebetween a material different in refractive index from the transparent materials.

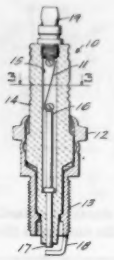
3,832,586

SPARK PLUG

Richard S. Podiak, Maumee, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio

Filed May 4, 1973, Ser. No. 357,324
Int. Cl. H01t 13/04
U.S. Cl. 313—118 7 Claims

The disclosure relates to an improved spark plug assembly, including an improved low inductance spring. The spring is positioned within the bore of a spark plug, either in conjunction with a noise suppression resistor or otherwise. The spring



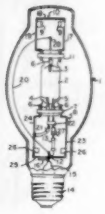
is formed from an elongated resilient conductor which is preferably flat. The spring is shaped into generally an "S" configuration with a curl at each end.

3,832,587

HEAVILY LOADED METAL HALIDE DISCHARGE LAMP

John F. Waymouth, Marblehead; Frederic Koury, Lexington, and Warren Calvin Gungle, Danvers, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 26, 1971, Ser. No. 202,502
Int. Cl. H01j 61/18
U.S. Cl. 313—184 2 Claims



A metal halide lamp is operated at higher than its normal rated wattage in order to increase its light output and efficacy, i.e., lumens per watt. But the quantity of fill in the arc tube must be less than a critical amount in order to prevent constriction of the arc discharge. The critical amount of fill is that which results in a value of 0.1 for the ratio of arc discharge pinch force to arc discharge buoyant force.

3,832,588

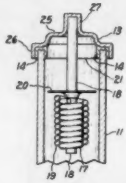
CERAMIC DISCHARGE LAMP HAVING METAL END CAP

Charles I. McVey, Shaker Hts., and Byron R. Collins, Euclid, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 25, 1972, Ser. No. 291,804
Int. Cl. H01j 1/94, 19/46
U.S. Cl. 313—217 7 Claims

An electric discharge lamp comprising a tubular light-transmitting envelope of alumina ceramic closed at each end by refractory metal end caps. The envelope contains a discharge sustaining filling and electrodes supported by the end caps. At

least one end cap is a thin-walled metal thimble having a skirt portion sealed to the end of the tube and a central blind teat in



which the electrode shank is seized. The need for critical welding or brazing to the end cap is thereby avoided.

3,832,589

HIGH-PRESSURE METAL VAPOR DISCHARGE LAMPS, PARTICULARLY SODIUM VAPOR LAMPS WITH HERMETIC SEAL

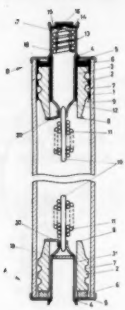
Johannes Pfaue, Berlin, Germany, assignor to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen GmbH, Munich, Germany

Filed Feb. 27, 1973, Ser. No. 336,371

Claims priority, application Germany, Mar. 1, 1972, 2209848

Int. Cl. H01j *17/18, 61/36*

U.S. Cl. 313—217 **9 Claims**



An annular member of ceramic is fitted into each end of the cylindrical arc tube of refractory light-transmissive material such as polycrystalline alumina and connected to the arc tube by sintering or by a glass or metal solder and having a hollow lead sealed internally thereof; the arrangement and the dimensions are so selected that the point of sealing of the annular member to the arc tube is protected from corrosion and a bubble-free solder seal is achieved.

3,832,590

HIGH PRESSURE METAL-VAPOR DISCHARGE LAMP HAVING ALUMINA TUBE WITH THICKENED END PORTIONS SEALED BY ALUMINA DISKS

Haruo Yamazaki, Moriyama; Hidezo Akutsu, Ashiya, and Takio Okamoto, Osaka, all of Japan, assignors to Matsushita Electronics Corporation, Kadama, Osaka Pref., Japan

Filed Mar. 2, 1973, Ser. No. 337,474

Claims priority, application Japan, Mar. 8, 1972, 47-25342

Int. Cl. H01j *61/30, 61/36*

U.S. Cl. 313—218 **6 Claims**

A high-pressure metal-vapor discharge tube having improved characteristics is disclosed. The tube has an alumina hollow discharge enclosure tube member, the ends of which are sealed by alumina end disks. The end disks have central apertures through which electrode lead in wires or rods extend into the discharge enclosure. The lead in wires or rods are made of a material which is resistant to the corrosive effects of metal halide. The hollow discharge enclosure tube member

has walls which are thicker at the two ends than in the intermediate region of the tube member. Preferably, the ends are more than twice as thick as the central walls. This results in a stronger seal between the alumina end disks and the tube member, thus not only avoiding the risk of breakage when sealing the tube member and manufacturing defects such as a defective seal, but also ensuring longer life of the lamp.

3,832,591

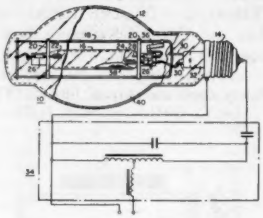
HIGH LUMINOUS EFFICACY WHITE APPEARING LAMP

Daniel A. Larson, Cedar Grove, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 30, 1973, Ser. No. 356,019

Int. Cl. H01j *61/18*

U.S. Cl. 313—229 **2 Claims**



A very efficient white emitting discharge lamp combination. The lamp is similar to a normal high pressure mercury discharge lamp but also contains sodium iodide and thallium iodide as discharge sustaining additives. The lamp also has a phosphor coating of strontium chloroapatite activated by divalent europium on the interior surface of the outer envelope. This combination provides a high intensity source of white light in an extremely efficient manner.

3,832,592

MASK ELECTRODE SUPPORT FOR COLOR PICTURE TUBE

Eiichi Yamazaki, Ichihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed June 30, 1972, Ser. No. 268,111

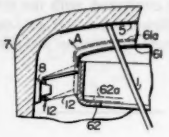
Claims priority, application Japan, July 5, 1971, 46-48836

Int. Cl. H01j *29/06*

U.S. Cl. 313—404 **6 Claims**

A color picture tube in which a color selective mask is supported by mask support means made of a plurality of elastic material sheets each shaped and arranged so as to have a relatively large elasticity in a direction being in a plane parallel to a side face of a mask frame to which the sheet is secured and perpendicular to the length of the side face, thus serving as a torsion spring, so that the path of local displacement of the

color selective mask and its peripheral frame due to thermal expansion or their displacement due to any external force is substantially coincident with the path of a deflected electron beam, thereby compensating for the deviations of relative positions between phosphor dots and corresponding apertures in the mask.



3,832,593

SELECTIVELY DAMPED TRAVELLING WAVE TUBE

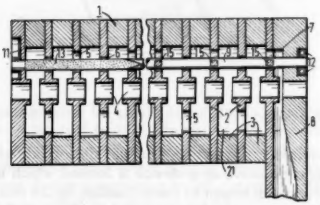
Franz Gross, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 15, 1973, Ser. No. 370,376

Claims priority, application Germany, June 28, 1972, 2231695

Int. Cl. H01j 25/34

U.S. Cl. 315—3.5 **13 Claims**



A travelling wave tube, with a delay line in the form of a wave guide having a plurality of slot-coupled disks secured thereto, has an elongate dielectric member received in aligned apertures of said disks. The dielectric member carries a plurality of metallized patterns which function to selectively damp electromagnetic waves of relatively high frequency, to suppress unwanted modes within said tube.

3,832,594

DYNAMIC CONVERGENCE CIRCUIT

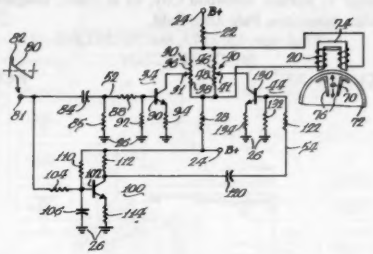
Marvin E. Miller, Des Plaines, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed Oct. 26, 1972, Ser. No. 301,261

Int. Cl. H01j 29/50

U.S. Cl. 315—13 C **13 Claims**

A convergence coil has both ends coupled through separate resistors to the same DC voltage. A pair of potentiometers have their fixed resistance portions coupled in parallel across the convergence coil. The wipers of both potentiometers are individually coupled to separate transistor amplifiers controlled by opposite going vertical deflection waveforms, so that the transistor amplifiers independently control convergence correction during the beginning and the end of a vertical scanning interval, respectively.



3,832,595

HORIZONTAL DEFLECTION SYSTEM WITH BOOSTED B PLUS

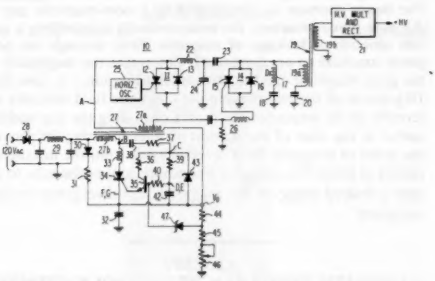
Wolfgang Friedrich Wilhelm Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 23, 1973, Ser. No. 344,296

Claims priority, application Great Britain, Apr. 5, 1972, 15576/72

Int. Cl. H01j 29/70

U.S. Cl. 315—27 TD **16 Claims**



A boosted B+ regulator in a horizontal deflection system adds a voltage derived from the deflection system to the line-rectified direct current voltage supplying the deflection system in such amount as to maintain a substantially constant boosted B+ supply voltage in the presence of variations of line voltage. Variations of the line-rectified voltage are sensed by a reference voltage network and added to a constant ramp voltage, the combination of voltages being applied to control the period of conduction of an active current conducting device which permits energy derived from the deflection system to be added to the line-rectified voltage supply for maintaining a regulated boosted supply voltage for the deflection system.

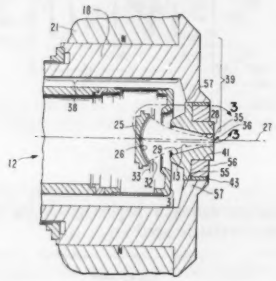
In one embodiment the energy derived from the deflection system is half-wave rectified by the active current conducting device. In a second embodiment the energy is full-wave rectified by the combination of the active current conducting device and an oppositely poled unidirectional current conducting device.

3,832,596

MAGNETIC STRUCTURE FOR FOCUSING OF LINEAR BEAMS

Richard B. Nelson; Erling L. Lien, both of Los Altos, and George V. Miram, Redwood City, all of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed Apr. 13, 1973, Ser. No. 351,065
Int. Cl. H01j 25/34
U.S. Cl. 315—3.5 8 Claims



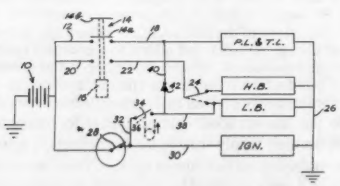
A high convergence magnetically focused linear beam tube includes a pair of magnetic pole piece structures at opposite ends of the interaction circuit. At least one of the magnetic pole piece structures includes a centrally apertured transverse wall and an axial tubular projection extending away from the transverse wall for shaping the magnetic field externally of the region of the interaction circuit. The diameter of the central aperture is predominantly determinative of the gradient of the convergent axial magnetic field in the high field region, i.e., greater than 50 percent of the maximum axial magnetic field especially in the region of the beam near the beam minimum. The beam aperture is surrounded by a non-magnetic gap in the pole piece structure for independently controlling a certain amount of leakage of magnetic field through the pole piece structure to predominantly determine the magnitude of the axial magnetic field in the low field region, i.e., less than 10 percent of the maximum axial magnetic field intensity externally of the interaction circuit. Controlling the gap width is useful in the case of permanent magnet focusing for moving the point of magnetic field reversal away from the interaction circuit at either the collector or cathode end of the tube to obtain a desired shape of the magnetic flux divergence or convergence.

3,832,597

AUTOMATIC VEHICLE LIGHT CONTROL SYSTEM FOR DAYLIGHT DRIVING

Bobby Lee Mitchell, 1525 Ivory, Klamath Falls, Oreg. 97601

Filed July 23, 1973, Ser. No. 381,389
Int. Cl. B60q 1/08
U.S. Cl. 315—82 4 Claims



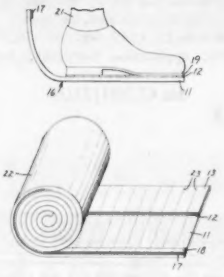
In an automotive vehicle it is conventional to provide parking lights, and running lights including high beam and low beam headlights, together with a principal light control switch adapted at any time to be set in either an "off," "park" or a "running" position, and a dimmer switch operable when the principal switch is in running position to choose between high beam and low beam headlights. The present invention includes such a system but combines and coordinates with it supplementary light energizing means for compelling all the running lights to be energized, with the definite exception of the high beam headlights, whenever, day or night, the ignition switch is placed in running position and the transmission is set for forward drive.

3,832,598

ELECTRICALLY CONDUCTIVE TAPE DEVICE

Richard W. Oehmke, Hudson Twsp., St. Croix Cty., Wis., and Paul H. Schertler, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 2, 1972, Ser. No. 294,075
Int. Cl. A61n 1/14; H01b 7/08
U.S. Cl. 317—2 B 8 Claims



An economical, disposable, flexible, slip or skid resistant, electrically conductive strip device is formed which is useful for temporary attachment to shoes, booties, or the like to provide for the dissipation of static electricity from the bodies of personnel in environments containing explosive or inflammable materials. The strip device comprises a flexible, skid resistant, conductive strip having at one end a footwear-sole-engaging portion provided with pressure sensitive adhesive for attachment to the personnel's footwear and means at the other end for temporary electrically conductive attachment to the body of the personnel.

3,832,599

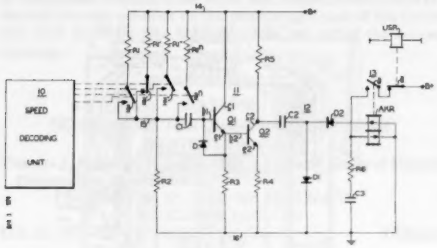
VITAL MORE RESTRICTIVE SPEED COMMAND SENSING CIRCUIT

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Aug. 15, 1973, Ser. No. 388,371
Int. Cl. H01h 47/00, 47/32
U.S. Cl. 317—5 10 Claims

This disclosure relates to a vital type of more restrictive vehicle speed command sensing circuit arrangement including a speed decoding unit, a switching circuit, a storage circuit and an acknowledging circuit. When a more restrictive speed command is received, the switching circuit is rendered con-

ductive. The conduction of the switching circuit causes the acknowledging circuit to be activated by the storage circuit



thereby acknowledging the reception of a more restrictive speed command.

3,832,600

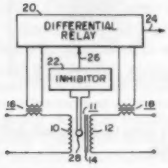
TRANSFORMER INTERNAL FAULT DETECTOR

Theodore R. Specht, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 17, 1973, Ser. No. 361,108

Int. Cl. H02h *3/28, 7/04*

U.S. Cl. 317—14 D **9 Claims**



A fault detector for power transformers which quickly indicates an internal fault condition. In one embodiment, the current in the primary and secondary windings are compared by a differential relay which may be restrained by a voltage developed during magnetizing inrush current conditions. This voltage is provided by a pick-up coil which is located between the primary winding and the magnetic core leg. The coil is oriented so that the voltage induced therein is relatively large when the core leg is saturated by an inrush current. In another embodiment, a first voltage from a similarly positioned pick-up coil is integrated and applied to a differential relay. A second voltage which is proportional to the difference between the magnetomotive forces in the primary and secondary windings is also applied to the differential relay. The differential relay compares the integrated voltage and the second voltage and is activated when an internal fault changes the normal ratio of these two voltages.

3,832,601

PHASE COMPARISON RELAYING APPARATUS WITH TWO-COUNT BY-PASS CIRCUIT

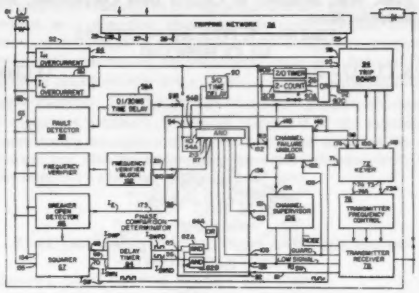
Walter L. Hinman, Jr., New Providence, and Russell W. Gonnam, Morris Plains, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 9, 1973, Ser. No. 387,070

Int. Cl. H02h *3/28*

U.S. Cl. 317—27 R **7 Claims**

A phase comparison unblocking relaying network which includes means to trip the circuit breaker upon the occurrence of a plural number of phase comparisons when the phase comparing information between the local and remote relaying stations has a lesser time overlap than the normal time for which



the security timer is set and which will, in the event of a time overlap of a predetermined interval greater than said normal time interval, trip the breaker without waiting for more than one phase comparison.

3,832,602

PRINT FOR CONTROL MODULES OF CONTACT-FREE CONTROL AND REGULATING SYSTEMS

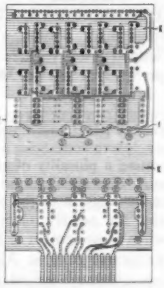
Dieter Engelhard, Grossgrundlach; Hermann Hofmann, Erlangen; Ulrich Schaff, Erlangen, and Walter Kaiser, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 100,574, Dec. 22, 1970. This application Aug. 28, 1972, Ser. No. 284,449

Claims priority, application Germany, Dec. 31, 1969, 1965683

Int. Cl. H05k *5/00*

U.S. Cl. 317—101 R **8 Claims**

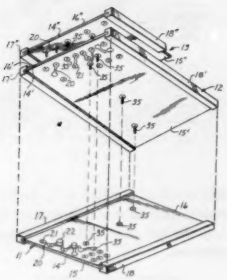


A print for control modules of contact-free control and regulating systems comprising an insulating carrier plate having one portion of one surface adjacent the control inputs provided with a plurality of anti-interference filters. The number of filters is the same as the number of control inputs. The other portion of the one surface of the plate is provided with the same number of threshold value stages connected to the filters. The other surface of the carrier plate has a metal layer thereon which is electrically interrupted in accordance with the boundary between the first and second portions of the one surface thereof. The portion of the layer corresponding to the first portion is connected to ground and the portion of the layer corresponding to the second portion is connected to a reference potential.

3,832,603
INTERCONNECT TECHNIQUE FOR STACKED CIRCUIT BOARDS

Seymour R. Cray, and Maurice D. Roush, both of Chippewa Falls, Wis., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Mar. 9, 1973, Ser. No. 339,673
Int. Cl. H05k 5/00
U.S. Cl. 317—101 D 11 Claims



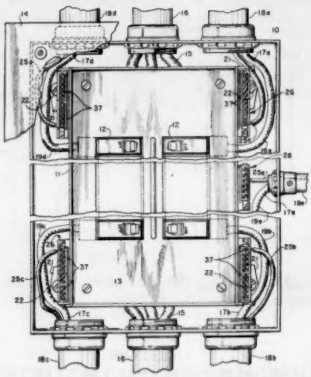
Circuit elements on circuit boards of a stacked assembly are electrically interconnected by interconnect devices located in a pseudo-random array on the boards. The interconnect devices include rigid, elongated members extending through the region separating adjacent circuit boards and assembled to receiver means, such as recesses, located in housings supported by an adjacent circuit board.

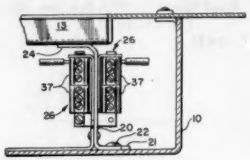
3,832,604
ELECTRICAL PROTECTIVE PANEL ASSEMBLY

Lawrence Carvin Goodridge, Bristol, Conn., assignor to General Electric Company, New York, N.Y.

Filed Apr. 9, 1973, Ser. No. 349,041
Int. Cl. H02b 1/04
U.S. Cl. 317—120 8 Claims

An electrical protective panel assembly comprising a conductive rectangular enclosure containing a conductive rectangular frame for mounting a plurality of electrical protective devices in the enclosure. Electrical ground contact assemblies are located at the corner regions of the panel assembly and each includes means for readily electrically connecting thereto the ground wires of equipment to be protected by the adjacently located protective devices. Alternatively, one or more such contact assemblies are mounted on the inner wall of the enclosure, on frame members at the corner sections of the frame structures or on lateral members of the frame structure. The contact assemblies can be mounted in position during original manufacture of the panel assembly or in the field. The ground contact assemblies each includes a conductive bracket having a terminal strap conductively and removably mounted therein. The strap carries one or more terminal strips with means for individually connecting a plurality of ground wires to the terminal strap. The terminal strips are each selectively and independently positionable in predeterminedly oriented positions to facilitate ground wire connections therein. Preferably the ground contact assemblies are removably mounted on frame members at the corner sections of the frame structure adjacent the point of entry of the wires into the enclosure and a plurality of these assemblies can be mounted in side-by-side or back-to-back relation on each corner or side of the frame structure. In panel assemblies in which the wiring enters the enclosure elsewhere than in the corner regions thereof, the contact assemblies are mounted on



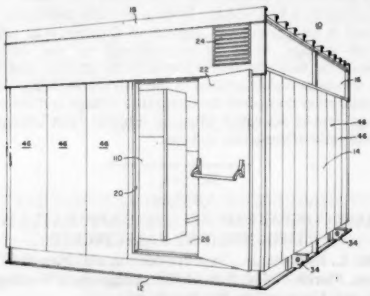


an internal support structure immediately adjacent the point of entry of the wiring.

3,832,605
PREFABRICATED HOUSING FOR ELECTRICAL SWITCHGEAR WITH EXTERNAL HOUSING WALL ATTACHMENT MEANS

Russell Clark, Jr., East Aurora, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 1, 1973, Ser. No. 356,266
Int. Cl. H02b 1/06, 1/08
U.S. Cl. 317—120 6 Claims



A prefabricated housing for electrical equipment such as switchgear having bottom, top, lower side, and upper side wall structures. The lower side wall structure comprises adjacent wall panels that are detachably secured externally to the bottom side wall structure and to the upper side wall structure.

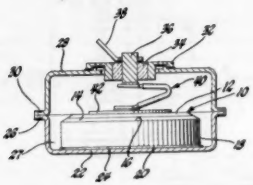
The upper side wall structure comprises wall panels that are detachably secured to the top wall structure and to the lower side wall structure. The housing comprises an access opening to the housing interior in the lower side wall structure and a U-shaped channel member on the interior side wall of the lower side wall structure that extends across the top of the access opening.

3,832,606

SEMICONDUCTOR DIODE PACKAGE WITH PROTECTION FUSE

Thomas J. Furnival, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 15, 1973, Ser. No. 332,630
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 317—234 R **2 Claims**



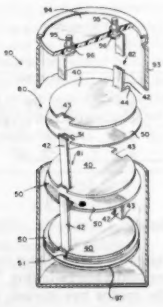
A circuit element for suppressing electrical transients. The circuit element includes a semiconductor diode and a distinctive fusible device encapsulated within a single housing. The fusible device is a metallic fuse element which is surrounded by an insulating jacket of polyimide plastic. The semiconductor diode is supported on a thermal expansion compensating element which in turn is mounted in a recess of a thin walled metallic housing member. A similar metallic member serves as a cover for the housing. The fusible device connects the diode with an insulatingly mounted electrically conductive lead that extends through the coer.

3,832,607

COLUMN TYPE STACKED PLATE CAPACITOR

Keith T. Obenchain, Lafayette, and James C. Jimerson, Indianapolis, both of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Feb. 20, 1974, Ser. No. 444,234
Int. Cl. H01g *1/14*
U.S. Cl. 317—261 **10 Claims**



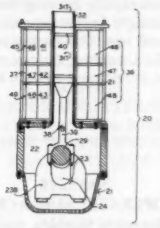
A capacitor including stacked anode and/or cathode plates of a closed plane curve configuration such as a circular plate or a closed plane having one or more acute, obtuse or right angles such as a rectangular plate, with at least one tab and at least one notch provided in each plate. The plates are stacked so as to have substantially the same axis and interleaved with and separated by a dielectric separator. Position of the tabs are alternated radially in the stack and the tabs formed so as to project in a direction approximately perpendicular to the plane of the plates. A capacitor of this design has improved electrical performance characteristics such as a reduced impedance characteristic and an ability to better withstand high ripple currents. The design may also allow greater utilization of capacitor volume and ease of alignment of the capacitor plates during construction. The stacked plate design of the invention can also be adapted for feed-through capacitors by providing for a plurality of tabs on each plate.

3,832,608

ELECTROMAGNETIC MOTORS AND PROCESS OF THEIR OPERATION

Marvin L. Mills, Box 878, Stinnett, Tex. 79083

Filed Sept. 18, 1973, Ser. No. 398,389
Int. Cl. H02k *33/00*
U.S. Cl. 318—37 **5 Claims**



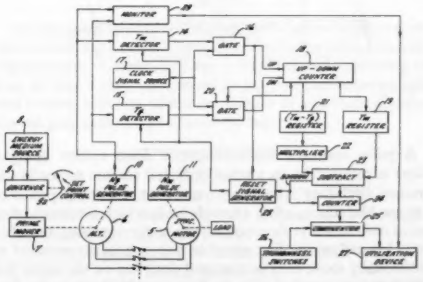
Electromagnetic reciprocating piston motors operate at wide speed range without changing direction of magnetic flux through the pistons and while positively maintaining the direction of flux in the pistons and while commutating triggering current to selected solenoid coils at low voltage.

3,832,609

SLIP DETECTION SYSTEM

William J. Barrett, Rockford, Ill., and Harold Green, Middleton, Wis., assignors to Woodward Governor Company, Rockford, Ill.

Filed Feb. 5, 1973, Ser. No. 329,697
Int. Cl. H02p *5/50*
U.S. Cl. 318—52 **31 Claims**



A system for detecting excessive slip between the speed of an a-c. motor and the speed of an a-c. generator supplying

power to the motor at a variable frequency. Transducers associated with the motor and the generator produce pulses at frequencies proportional to the speeds of the motor and the generator, respectively. The periods T_m and T_g of these two series of pulses are measured by applying clock pulses to a counter during each period, so that the number of clock pulses counted during each period is proportional to the duration thereof. The pulses applied to the counter during the period T_m are counted up, and the pulses applied during the period T_g are counted down, so that the resulting output of the counter represents the difference $(T_m - T_g)$. The count representing the period T_m is stored in a separate register, and the number representing T_m is then repetitively subtracted from the number representing $(T_m - T_g)$ until the remainder is reduced to zero. The number of subtraction steps required to reduce the remainder to zero is counted to provide a number representing the quotient $(T_m - T_g)/T_m$. This quotient represents the per cent slip of the motor, and is compared with a preselected per cent slip limit determined by the setting of a series of thumbwheel switches. If the measured per cent slip value exceeds the preselected limit, an output signal is generated for actuating an alarm or other suitable utilization device so that the excessive slip condition can be corrected. Computation of the actual per cent slip is carried out by digital signal processing on a rapidly iterating basis so that the system provides a substantially instantaneous indication of any change in the percent slip. The system includes a number of auxiliary features for detecting various malfunctions and for resetting the system in response to both internal and external command signals.

3,832,610

PULSE OPERATED SURFACE MOTOR

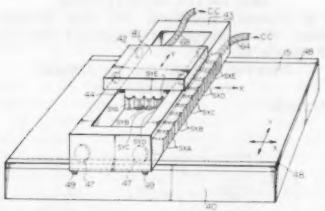
Kanryo Shimizu; Hiromichi Shichida, and Kenichi Toyoda, all of Tokyo, Japan, assignors to Fujitsu Limited and Fujitsu Fanuc Limited, both of Tokyo, Japan

Filed Aug. 31, 1973, Ser. No. 393,465

Claims priority, application Japan, Sept. 8, 1972, 47-90079; Sept. 8, 1972, 47-90080

Int. Cl. H02k *41/02*

U.S. Cl. 318—135 **3 Claims**



A pulse operated electromagnetic drive system along a plane is referred to, as a pulse operated surface motor in the present disclosure. The pulse operated motor is comprised of a plane-like stator, a first movable body which is restrained to move only in a first direction on the stator, a second movable body located on the first movable body which is restrained to individually move only in a second direction on the stator but which moves together with the first movable body in the first direction perpendicular to the second direction and sliders which are fixed to said first or second movable body, cooperate electromagnetically with said plane-like stator.

3,832,611

CYCLOCONVERTER TYPE THYRISTOR MOTOR

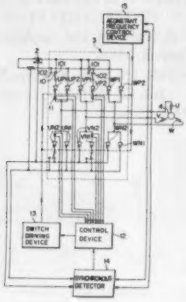
Yoshimitsu Onoda; Kunio Saito; Yosio Okumura, all of Katsuta; Toshiaki Okuyama, Hitachi, and Nobuaki Otazawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 31, 1973, Ser. No. 384,297

Claims priority, application Japan, Aug. 7, 1972, 47-78352

Int. Cl. H02p *5/34*

U.S. Cl. 318—171 **11 Claims**



A thyristor motor comprising a synchronous motor, a cycloconverter of thyristor type connected with the synchronous motor to supply electric power for the motor, current detectors provided in the thyristor arms of the cycloconverter, switches provided in the arms, a means for detecting the coincidence between the power frequency and the motor frequency, and another means for determining an instant at which the switches are opened to disconnect the arms, depending upon the output signals of the current detector and the detecting means and for connecting the disconnected arms in parallel with one another, whereby the current concentration upon a particular thyristor and the undulation of the voltage induced by the thyristor motor are prevented.

3,832,612

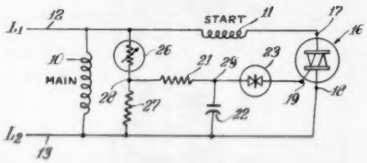
ELECTRICAL TIMING CIRCUIT FOR CONTROLLING ENERGIZATION OF A LOAD

Richard E. Woods, Markle, Ind., assignor to Franklin Electric Co., Inc., Bluffton, Ind.

Filed July 29, 1970, Ser. No. 59,257

Int. Cl. H02p *1/44*

U.S. Cl. 318—221 E **15 Claims**



This disclosure deals with a split phase induction motor including a main winding and a start winding. To de-energize the start winding after the motor has started, a solid state electronic switch is connected in series with the start winding and an oscillator is connected to actuate the switch. An electrical element having an impedance which varies with the temperature thereof is connected to control operation of the oscillator. When the motor is initially energized, the temperature of

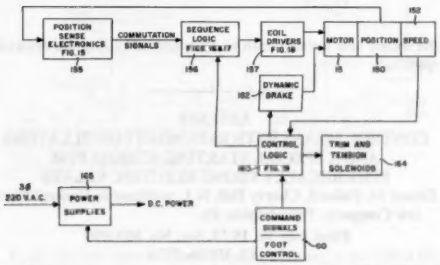
the element is low, the oscillator operates, and the switch is closed. As the motor speeds up, the element is heated, such heating changing its electrical impedance. When the temperature of the element reaches a certain value, the oscillator is turned off, the switch is opened and the start winding is de-energized.

3,832,613

SEWING MACHINE MOTOR AND CONTROL CIRCUIT

Benjamin T. Bernstein, Highland Park, Ill.; James R. Crawshaw, Trotwood, and Morris H. McCurry, Dayton, both of Ohio, assignors to Union Specially Machine Company, Chicago, Ill.

Filed May 14, 1973, Ser. No. 359,870
Int. Cl. H02k *29/00*
U.S. Cl. 318—269 **14 Claims**



A solid state sewing machine drive system includes a brushless direct current motor, the speed of which is set and maintained by controlling the width of the field energization pulses. The motor is accelerated and maintained at a selected speed while operating in a closed loop mode, decelerated quickly to a stop by means of a dynamic brake, driven in an open loop stepping mode to a selected angular position, and then magnetically held in that position. Alternatively the motor may be decelerated to a predetermined low speed near stop by a dynamic brake and then driven in an open loop stepping mode to a predetermined angular position where it is held magnetically in that position. The motor includes fixed sensing inductors which sense the proximity of metallic segments rotating with the permanent magnet motor rotor for providing motor commutation signals and signals representing one possible stopping position of the rotor, and other sensing inductors which may be rotated relative to the motor field windings for providing signals representing another, angular positionable stopping position of the rotor. The circuit for supplying energization pulses to the motor field when operated in the open loop mode is provided with information regarding actual rotor position while the motor is decelerated so that when the stepping mode is actually begun, the rotor will continue to rotate in the same direction and will be synchronized with the rotating magnetic field.

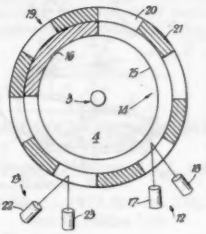
3,832,614

CENTRIFUGES

David William Olliffe, Crawley, England, assignor to M.S.E. Holdings Limited, Sussex, England

Filed Aug. 6, 1970, Ser. No. 61,602
Int. Cl. H02p *5/16*
U.S. Cl. 318—313 **4 Claims**

An analytical centrifuge to receive a plurality of different rotors each carrying a track with a segment having a light reflective property distinct from adjacent regions of the track and having a length along the track which is related to the maximum desired speed of the rotor, the centrifuge having optical sensing means for sensing said segment and a time comparator for comparing the duration of the signal obtained by the sensing means in each rotor revolution with a fixed time to sense when the maximum desired speed is reached. Analytical



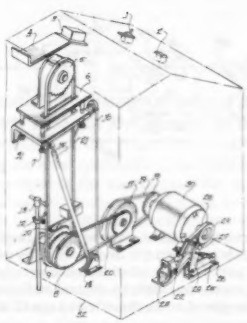
rotors also carry a further track having distinct segments corresponding to respective compartments of the rotor and which are optically sensed to provide in conjunction with the signal obtained from the first-mentioned segment gating signals for examining selectable compartments of the rotor one-by-one.

3,832,615

ELECTRIC GRAIN GATE CONTROL

Otis Fitch, P.O. Box 171, Byers, Colo. 80103

Filed Feb. 4, 1974, Ser. No. 429,321
Int. Cl. H01h *35/24*
U.S. Cl. 318—481 **4 Claims**



An improved method of operating the gates in grain elevators is disclosed herein. The control device includes, thru electric circuitry, a means of fully controlling and regulating the gate so that it may be stopped at any position between open and closed, with the additional feature of automatically closing the gate in the event of a power failure.

3,832,616

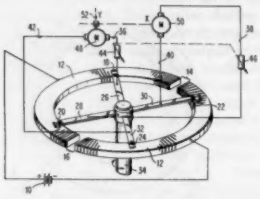
PLURAL MOTOR CONTROL CIRCUIT

Tihamer S. Vinner, Somerset, N.J., assignor to SLM Plastics, Inc., Somerset, N.J., a part interest

Filed Sept. 27, 1972, Ser. No. 292,617
Int. Cl. G05b *19/36*
U.S. Cl. 318—576 **8 Claims**

Disclosed is a motor control circuit for simultaneously controlling a plurality of motors, said motors in turn controlling

the motion of a translatable point along a desired straight or curved path. A first motor is adapted to move said point along a first axis at a first speed, while a second motor is adapted to move said point along a second axis at a second speed. The motor control circuit controls the relative speed of the first



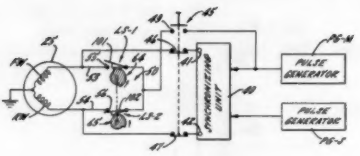
and second motors, thereby determining the velocity and path of the translatable point. As a preferred use of the control circuit, the translatable point is a magnet movable under a non-magnetic game board. On the top surface of the game board, a toy vehicle or the like is moved by the magnet.

3,832,617

MOTOR CONTROL APPARATUS WITH GENEVA-TYPE SWITCH ACTUATING MECHANISM

Bruce G. Spencer, Jr., Rockford, Ill., assignor to Woodward Governor Company, Rockford, Ill.

Filed May 24, 1972, Ser. No. 256,267
Int. Cl. G05b 11/14
U.S. Cl. 318—673 **6 Claims**



A Geneva-type drive unit with overlapping driving and driven wheels in which the driven wheel is advanced intermittently and carries cams which actuate switches for controlling a stepping motor operable to expand and contract an adjustable link interposed in the throttle linkage of an engine.

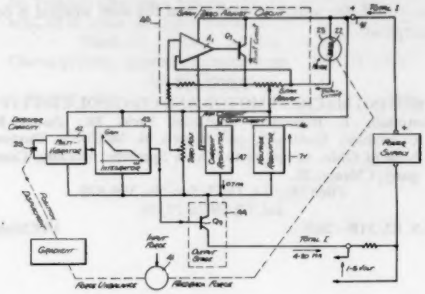
3,832,618

ELECTRONIC DIFFERENTIAL PRESSURE TRANSMITTER

Peter S. Levesque, Jenkintown, and Max Gaertner, Warminster, both of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Jan. 29, 1973, Ser. No. 327,562
Int. Cl. G01l 9/10
U.S. Cl. 318—676 **11 Claims**

An electronic differential pressure transmitter for use with industrial processes to produce an output signal suitable for transmission to a remote station for operating, indicating, recording or control equipment. The transmitter includes a force bar to which an input force is applied, the resultant bar displacement being sensed by a detector coupled to an electronic circuit yielding a feedback signal proportional to the input force. The feedback signal is fed to a motor that applies to the bar a rebalancing force in opposition to the input force. Adjustment in the span of the instrument is effected electronically by a circuit in which the feedback signal is split between



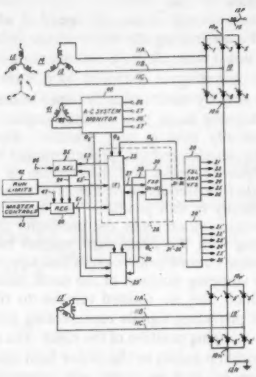
the motor and a shunt path to an extent affording the desired span.

3,832,619

CONTROL MEANS WITH REDUNDANT OSCILLATORS AND A SPECIAL STARTING SCHEME FOR PERIODICALLY FIRING ELECTRIC VALVES

Ernest M. Pollard, Cherry Hill, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed July 30, 1973, Ser. No. 383,899
Int. Cl. H02m 7/20
U.S. Cl. 321—5 **23 Claims**



In an electric power delivery system, a plurality of controllable electric valves which are arranged in a bridge configuration are respectively fired in a predetermined sequence by a family of individual firing signals. At least three redundant frequency modulated oscillators and a distributor are used for cyclically generating the firing signals in timed relation to the alternating voltage of the power system. Each of the oscillators produces a train of discrete pulses at a frequency which normally is a predetermined harmonic of the system frequency, and the distributor includes voting logic means which enables a firing signal to be produced in the event of a coincidence of discrete pulses from any two of the oscillators. Concurrently with the commencement of each firing signal, all of the oscillators are simultaneously recycled. A special scheme is provided for starting the firing signal generator in

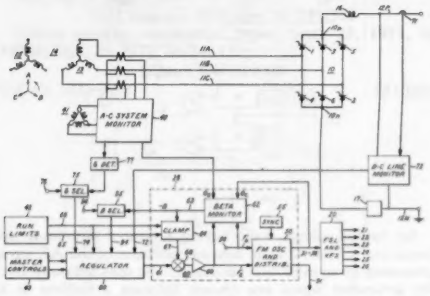
step with system voltage so that the initial firing signal is associated with a predetermined one of the valves and is characterized by a known firing angle of desired value.

3,832,620

REGULATING MODE SELECTOR SCHEME FOR AN ELECTRIC POWER CONVERTER

Ernest M. Pollard, Cherry Hill, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed July 26, 1973, Ser. No. 382,742
Int. Cl. H02m *7/20*
U.S. Cl. 321—5 **14 Claims**



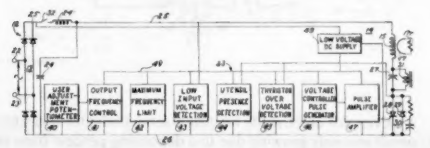
In an electric power delivery system, means is provided for controlling the operation of a static power converter as a function of the magnitude and the polarity of a variable bipolar control signal. The control signal in turn is a function of a selected one of a plurality of variable bipolar input signals which respectively depend on the differences between actual and desired magnitudes of a plurality of different quantities dervied from the system. To select the proper input signal, first means is provided for deriving an output signal whose value depends on the most positive ranking signal in a first set of at least two of said input signals, second means is provided for deriving a resultant error signal which is representative of the most negative signal in a group consisting of the aforesaid most positive one signal and any signal in a second set of at least another of said input signals, and means is connected to the second means for producing the control signal which responds to variations of said resultant error signal.

3,832,621

RELIABLE STATIC POWER CONVERTER WITH CONTROL LOGIC

William P. Kornrumpf, and John D. Harnden, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 211,926, Dec. 27, 1971. This application Apr. 2, 1973, Ser. No. 346,982
Int. Cl. H02m *1/18*
U.S. Cl. 321—11 **9 Claims**



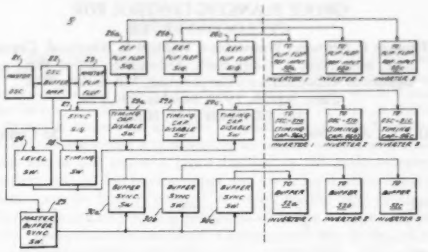
The control circuit for an inverter is suitable for fabrication as an integrated circuit and includes, in addition to turn-on circuitry, protection circuits to assure reliable and automatic operation under abnormal circuit conditions such as overvoltages and low input voltages tending to cause device and power circuit failures. Voltage responsive sensors such as Zener diodes sense the appropriate voltages at selected points on the power circuit and modify the operation of the control circuit, preferably by over-riding and inhibiting the turn-on circuitry. Disclosed with regard to a one-thyristor, variable frequency series resonant inverter with an added maximum frequency control, the protection circuit technique is applicable to inverters generally.

3,832,622

PARALLEL PHASE LOCK CIRCUITRY FOR INVERTERS AND THE LIKE

Albert William Compoly, Monmouth, N.J., assignor to Avionic Instruments Inc., Rahway, N.J.

Filed July 11, 1973, Ser. No. 378,175
Int. Cl. H02m *7/00*
U.S. Cl. 321—27 R **5 Claims**



Phase lock circuitry for operating a plurality of static inverters in synchronism. The phase lock circuitry includes means for detecting operation of the phase lock circuitry master oscillator, causing the local oscillators of the static inverters to be disabled. The output of the master oscillator is utilized to drive all inverters coupled to the parallel phase lock circuitry. The parallel phase lock circuitry also includes an output which assures that the local flip-flop of each static inverter is in the appropriate state while the output of the master oscillator controls the operating rate of the static inverter flip-flops, thus absolutely assuring operation of the plurality of static inverters in synchronism with the master oscillator. In the event of a failure of the master oscillator a level switch detects this condition to permit operation of the static inverters controlled by the phase lock circuitry without in any way effecting their operability providing a safety feature wherein the static inverters remain operational, but are not necessarily maintained in synchronism.

3,832,623

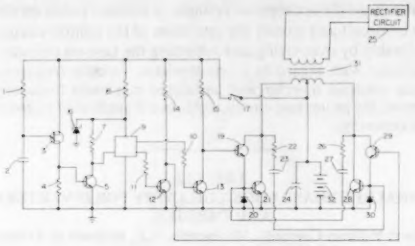
INVERTER-CONVERTER POWER SUPPLY SYSTEM

Willis Guild Boyden, and Richard Astourre Shaw, both of Norwood, Mass., assignors to North American Electronics Corporation, Norwood, Mass.

Filed Nov. 17, 1972, Ser. No. 307,504
Int. Cl. H02m *7/52*
U.S. Cl. 321—45 R **1 Claim**

An inverter-converter power supply system with bistable means to alternately gate a pair of switching transistors, the transistors controlling current flow through opposite halves of a transformer winding from a DC voltage source. The

transistors are cross-coupled by series connected RC circuits for rapid de-saturation and overload protection, while excessive transistor base voltage levels are prevented by diodes connected between the transistor bases and ground.



3,832,624

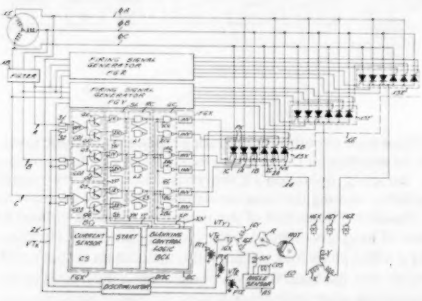
GROUP BLANKING CONTROL FOR CYCLOCONVERTER

Thomas P. Gilmore, Wauwatosa; William L. Ringland, Greendale, and Allois F. Geiersbach, Milwaukee, all of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 6, 1973, Ser. No. 394,979

Int. Cl. H02m 5/30; H02p

U.S. Cl. 321—66 **35 Claims**



A cycloconverter has a positive current group of SCR's and a negative current group of SCR's connected in parallel between a polyphase supply course and an output lead with the output side of the positive and negative groups connected directly together. Gating signals are sequentially derived for the SCR's of the positive and negative groups, and gating signals to the positive and negative groups are blanked alternately when the current in the output lead is negative and positive respectively. The gating signal deriving means are disabled when the output current decreases to a predetermined triggering level in crossing the zero axis in either direction, and gating signals are applied to the last conducting SCR and to the SCR of the nonconducting group connected to the same phase of the supply source so that intergroup circulating currents are prevented. When the output current increases beyond the triggering level, the last conducting SCR is commutated and the gating signal deriving means is enabled after a sufficient time delay to allow said last conducting SCR to commutate.

3,832,625

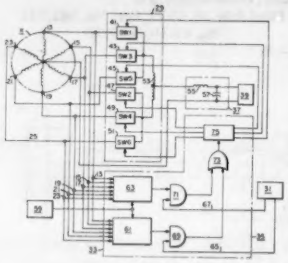
ELECTRICAL POWER GENERATING ARRANGEMENT AND METHOD UTILIZING AN INDUCTION GENERATOR

Laszlo Gyugyi, Pen Hills, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1973, Ser. No. 336,140

Int. Cl. H02p 9/46

U.S. Cl. 322—47 **23 Claims**



An output voltage wave having a desired amplitude and frequency is formed from selected portions of the AC signal generated by an induction generator. The selected portions of the generated signal are chosen in such a fashion as to establish the phase angle of the current drawn from the induction generator at a value that results in an appropriate excitation current being provided for the induction generator. Control arrangements are utilized to determine the required phase angle for the current drawn from the induction generator and to determine the portions of the generated signal that must be utilized to provide such a phase angle. Establishing the phase angle of the current drawn from the induction generator is accomplished without affecting the phase angle of the output current, which is determined by the load.

3,832,626

DEVICE FOR ELECTRICALLY HEATING A SEMICONDUCTOR ROD WHICH IS SIMULTANEOUSLY GROWING DUE TO A DEPOSITING PROCESS FROM THE GAS PHASE

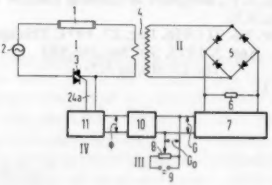
Hans Stut, Groebenzell, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 5, 1972, Ser. No. 269,154

Claims priority, application Germany, July 7, 1971, 2133863

Int. Cl. G05f; H02m 1/14; B01d

U.S. Cl. 323—4 **13 Claims**



A device for electrically heating a semiconductor rod which is simultaneously growing due to a depositing process from the gas phase employs a heating current source for supplying an alternating voltage and an electronic switch which is operated by a time wise variable auxiliary voltage for controlling the ap-

plication of heating current supplied by the heating current source to the semiconductor rod. A second circuit is coupled to the aforementioned circuit to rectify the applied voltage and pass the rectification product to a four-pole smoothing filter circuit. The differential voltage at the output of the four-pole circuit, with respect to a reference voltage, serves to control a generator for generating the auxiliary voltage in such a way that the auxiliary voltage is applied earlier in response to larger values of difference voltage.

3,832,627

TRANSISTOR CIRCUIT WITH SLOW VOLTAGE RISE AND FAST VOLTAGE FALL CHARACTERISTIC

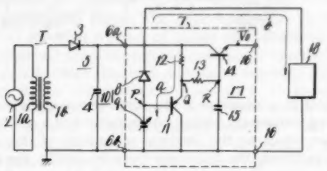
Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 22, 1972, Ser. No. 291,352

Claims priority, application Japan, Sept. 25, 1971, 46-74840; Sept. 25, 1971, 46-74841

Int. Cl. G05f *5/00*

U.S. Cl. 323—22 T **13 Claims**



A transistor circuit comprises a series circuit consisting of a diode and a capacitor, which is connected in parallel to a DC electric power source, and a first transistor has its base electrode connected to the junction of the diode and capacitor of the series circuit, its emitter electrode connected to one terminal of the DC power source through a resistor, and its collector electrode connected to the other terminal of the DC power source. A second transistor, has its base electrode connected to the junction of the emitter electrode of the first transistor and the resistor, its collector electrode connected to one terminal of the DC power source, and its emitter electrode connected to an output terminal.

3,832,628

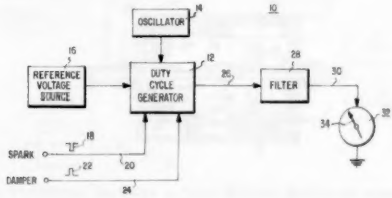
ENGINE TIMER

Joseph R. Pottebaum, Columbus, Ohio, assignor to Production Measurements Corporation, Hilliard, Ohio

Filed Dec. 8, 1972, Ser. No. 313,484

Int. Cl. F02p *17/00*

U.S. Cl. 324—16 R **18 Claims**



Disclosed is a timer for indicating the average timing of an internal combustion engine. The timer includes a duty cycle generator which produces a series of pulses whose duty cycle varies with the average timing of the engine. These pulses are fed through a filter to produce an analog signal for display by a conventional voltmeter or ammeter.

3,832,629

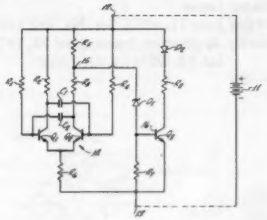
BATTERY CONDITION INDICATOR

Edward Cernek, Jr., Santa Ana, Calif., assignor to ADAR, Inc., Santa Ana, Calif.

Filed Jan. 26, 1973, Ser. No. 326,894

Int. Cl. G01n *27/42*; **G08b** *21/00*

U.S. Cl. 324—29.5 **8 Claims**



A Battery Voltage Indicator is provided for indicating the condition of the battery or dry cells or the like by providing light flashes or a steady light from a light emitting diode when the battery voltage is in the range for a usable battery. A multivibrator is connected to derive its operating voltage from the battery being tested and produces an output wave that fluctuates above and below a given fraction of the multi-vibrator battery voltage but having upper and lower levels each dependent upon the battery voltage. A circuit for the light emitting diode is provided which is energized when the voltage input is above the predetermined level. Consequently the diode either emits light continuously, flashes, or remains dark, depending upon whether the battery is good, weak, or dead.

3,832,630

METHOD AND APPARATUS OF MEASURING THE CHARACTERISTIC RESONANCE FREQUENCY OF AN ELECTRIC ELEMENT

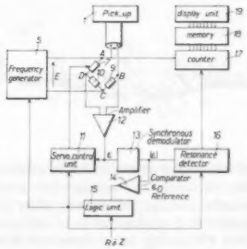
Pierre Micol, Dammarie-les-Lys, and Yves Jacquet, Paris, both of France, assignors to Societe Nationale D'Etude Et De Construction, Paris, France

Filed May 16, 1973, Ser. No. 360,674

Claims priority, application France, May 17, 1972, 72.17608

Int. Cl. G01r *29/22*

U.S. Cl. 324—56 **4 Claims**



Apparatus for measuring a characteristic resonance frequency of an electric element, for example a piezoelectric

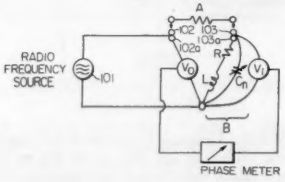
pick-up, for the purpose of checking the condition of such element, in which the element is connected in an electric bridge fed by a variable low-frequency source, which bridge is adjusted until it is balanced, and then the frequency of the source is varied to detect the resonance. The bridge may be automatic and have purely electronic elements.

3,832,631

METHOD FOR MEASURING PARAMETERS OF QUARTZ CRYSTAL UNITS AND FIXTURE FOR CARRYING OUT THE SAME

Issac Koga; Shigeo Kobayashi, and Isao Okamoto, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed June 21, 1973, Ser. No. 372,165
Claims priority, application Japan, June 28, 1972, 47-64064
Int. Cl. G01r *29/22, 23/00*
U.S. Cl. 324—56 **2 Claims**



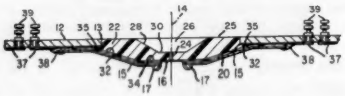
The present invention discloses a method and fixtures for measuring parameters of quartz crystal units in the very high frequency (VHF) range. A non-reactive frequency and resistance of the crystal unit are determined, a radio-frequency voltage is applied to a series circuit composed of said crystal unit and a circuit which is adjustable to non-reactive resistance, the phase of the terminal voltage across said circuit which is adjustable to non-reactive resistance is adjusted so as to coincide with the phase of the terminal voltage across said series circuit. Next, said crystal unit is replaced by another crystal unit, and the frequency of said radio-frequency voltage is adjusted so that the above-mentioned two phases coincide Thus the non-reactive frequencies and or resistances of a plurality of crystal units are quickly determined.

3,832,632

MULTI-POINT PROBE HEAD ASSEMBLY

Frank J. Ardezzone, 387 Mathew St., Santa Clara, Calif. 95050

Filed Nov. 22, 1971, Ser. No. 201,098
Int. Cl. G01r *1/06, 31/22*
U.S. Cl. 324—158 P **6 Claims**



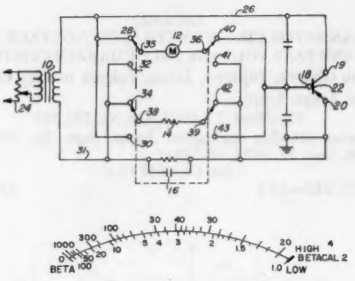
A multi-point test probe assembly for interface contact with miniature electronic devices. The assembly comprises a plurality of electrically conductive probes each adapted to be electrically engaged to a conductive lead and each probe having a probe arm extending to a common area with a tip adapted for interface contact with a terminal of a miniature electronic device positioned within said common area. The probe tips may be comprised of a compressible elastic material. A probe support member engages each of the probe arms and tips to support the arms and tips about said common area.

3,832,633

TRANSISTOR BETA MEASURING INSTRUMENT

Ralph H. Bowden, 1800 Edgewood, Sioux Falls, S. Dak. 57107

Continuation of Ser. No. 34,084, May 4, 1970, abandoned.
This application Feb. 22, 1972, Ser. No. 227,942
Int. Cl. G01r *31/22*
U.S. Cl. 324—158 T **2 Claims**



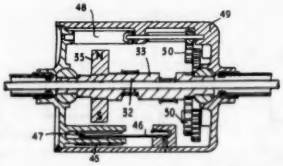
The beta of a transistor is measured in two steps with a beta measuring instrument having an ammeter and a resistor with a resistance equal to the internal resistance of the ammeter without removing the transistor from its circuit, the first step being the calibration of the ammeter to full scale deflection by connecting it in the emitter circuit of the transistor with the resistor in the base circuit and applying an A.C. voltage across the emitter, and collector of the transistor of sufficient amplitude to cause full scale deflection of the ammeter with the transistor operating as a class B amplifier and the second step being the measurement of the beta by, after calibration, connecting the resistor in series with the emitter and the ammeter in series with the base to measure the base current.

3,832,634

SPEED INDICATOR

Joseph Galea, Merrylands, N.S.W., Australia, assignor to Gordon Maxwell Austin, Grenfell, N.S.W., Australia

Filed Oct. 17, 1972, Ser. No. 298,419
Claims priority, application Australia, Oct. 18, 1971, 6670/71; Apr. 12, 1972, 8575/72
Int. Cl. G01p *3/42*
U.S. Cl. 324—160 **3 Claims**

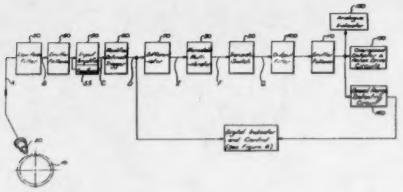


A speed indicator including a plurality of tuned reeds. A permanent magnet is mounted for rotation past the reeds which are so positioned that, upon oscillation of a particular reed at its resonant frequency, that reed contacts and adjacent surface to produce an audible signal.

3,832,635
COMBINED DIGITAL-ANALOGUE SPEEDOMETER

George Robert Cass, Montreal, Quebec, Canada, assignor to Canadian National Railway Company, Montreal, Quebec, Canada

Filed Jan. 7, 1972, Ser. No. 215,999
Int. Cl. G01p 3/56
U.S. Cl. 324—166 5 Claims

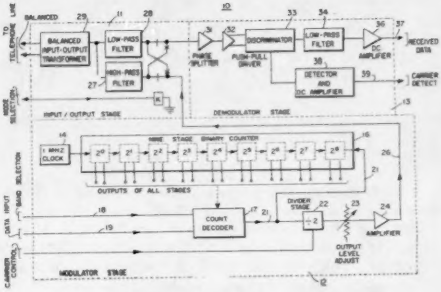


The rotation of a railway vehicle wheel is used to supply a periodically varying signal. The periodically varying signal is used to (a) generate a series of pulses of constant amplitude and duration and proportional in frequency to the periodically varying signal which constant amplitude duration pulses are subjected to an integrationtype operation to produce an analogue indication of the railway vehicle speed; and (b) generate pulses of frequency proportional to that of the periodically varying signal, which may be counted and displayed over a sampling period to provide a digital indication of the railway vehicle speed. With the digital indication a scale switching arrangement is provided so that the indicated speed units are larger at low than at high speeds. Provision in the system is made so that switching from low speed to high speed scale takes place at a higher speed than from high speed to low speed scale to reduce the frequency of scale switching.

3,832,637
FSK MODEM

Thomas Theron Alexander, Lansdale, Pa.; Alfons Reszka, Northbrook, and Charles Keith Stenerson, Park Ridge, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed June 22, 1973, Ser. No. 372,884
Int. Cl. H04l 27/10
U.S. Cl. 325—30 6 Claims

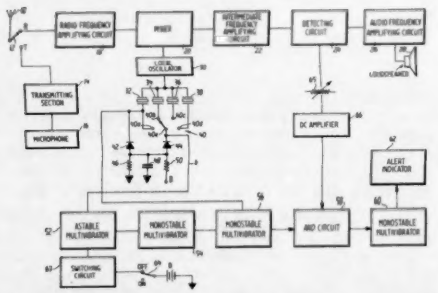


A low-speed FSK data modem. A crystal-controlled oscillator drives a ripple-carry binary-counter. The intermediate outputs of the counter are selectively connected to four NAND-gates which decode the four counts which correspond to the four possible FSK output frequencies. Logic means are provided to ensure that the mark-to-space and space-to-mark transitions of the modem output are always graceful.

3,832,636
TRANSCEIVER WITH TIME DIVISION MEANS FOR INDICATING THE PRESENCE OF AN EMERGENCY CHANNEL SIGNAL WHILE RECEIVING INFORMATION ON A NORMAL CHANNEL

Mutsuo Kubo, Tokyo, Japan, assignor to Tokyo Shibaura Electric Company, Limited, Kanagawa-ken, Japan

Filed Nov. 2, 1972, Ser. No. 303,023
Int. Cl. H04b 1/40
U.S. Cl. 325—25 12 Claims

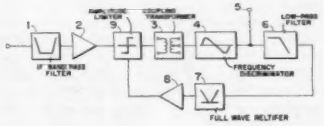


A transceiver includes a time division receiving system which shares reception between a normal channel and an emergency channel. The normal channel is shared for a sufficient time to minimize loss of normal channel signal information while providing means for indicating reception of a signal on the emergency channel and displaying the reception by means of an indicator.

3,832,638
OUTPUT CONTROL DEVICE OF FM RECEIVER

Shin-Ichi Ohashi, and Isao Fukushima, both of Toyokawa, Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Nov. 15, 1972, Ser. No. 306,682
Claims priority, application Japan, Nov. 15, 1971, 46-90606
Int. Cl. H03d 3/00
U.S. Cl. 325—347 9 Claims



An output control device for use in FM receivers comprises a low-pass filter for deriving only the d-c component from the output of a frequency discriminator, and a rectifier circuit for full-wave rectifying the output of the low-pass filter. The output of the rectifier circuit is applied to the amplitude limiter which is connected to the input circuit of the frequency discriminator, to cause the amplitude limiting level of the amplitude limiter to be changed, thereby minimizing the nonlinear distortion developed in the frequency discriminator due to the deviation in the tuning of the FM receiver.

3,832,639
TONE GENERATOR FOR GENERATING SELECTED FREQUENCIES

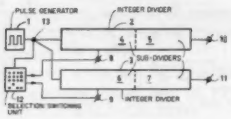
Daniel Johannes Gerardus Janssen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 29, 1973, Ser. No. 364,969

Claims priority, application Netherlands, June 10, 1972, 727933

Int. Cl. H03b *19/06*

U.S. Cl. 328—14 **6 Claims**



A tone generator comprising a pulse oscillator, a divider having an adjustable integer dividend which is connected thereto and which comprises a sub-divider having an adjustable fractional dividend, and a sub-divider which is connected thereto and which has a fixed integer dividend, the latter sub-divider also constituting a binary-to-digitial converter.

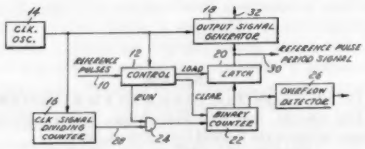
3,832,640
TIME DIVISION INTERPOLATOR

Alf L. Cederquist, Ypsilanti, and Shaun S. Devlin, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 11, 1972, Ser. No. 314,047

Int. Cl. H03k *5/00*

U.S. Cl. 328—38 **20 Claims**



An electronic circuit is disclosed for generating an output signal having a frequency which is a selected multiple of a variable input signal frequency. To obtain the desired multiplication, a relatively high clock signal frequency is divided by a number which corresponds to the selected multiple to produce a second signal having a lower frequency than the clock signal frequency. The individual pulses of the lower frequency signal are counted during the time interval between two consecutive input signal pulses to generate a second, variable, number which is then used to divide the clock signal frequency in the time period immediately following the occurrence of the second of the two consecutive input signal pulses. The resulting output signal therefore occurs at a frequency which is equal to the frequency of the input signal multiplied by the desired multiplicative factor.

3,832,641
VOLTAGE REFERENCE SOURCE ADJUSTABLE AS REGARDS AMPLITUDE PHASE AND FREQUENCY

Louis W. Herchenroeder, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

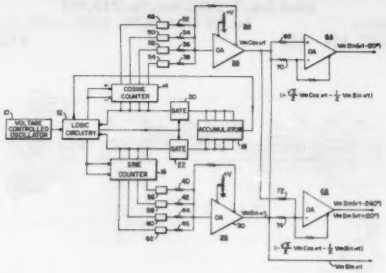
Filed Oct. 18, 1973, Ser. No. 407,726

Int. Cl. H03k *1/02*

U.S. Cl. 328—258 **10 Claims**

A voltage reference source is provided in which a pulse source under the regimen of logic circuitry disciplines the count of two digital counters, one for counting a cosine function through 360 electrical degrees, the other counting a sine function through 360 electrical degrees. Digital to analog converters coupled to the respective counters convert the digital intelligence into analog wave forms Vm cos ωt and Vm sin ωt.

Additionally by algebraic summation operational amplifiers are used to convert the two phase outputs Vm cos ωt and Vm sin ωt into a three phase voltage output.



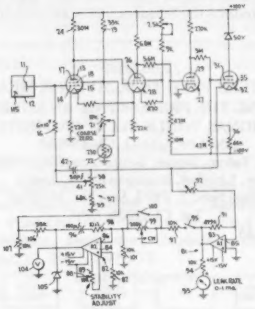
3,832,642
CURRENT MEASURING CIRCUIT AND METHOD

Walter Helgeland, Lexington, Mass., assignor to Varian Associates, Palo Alto, Calif.

Filed Nov. 29, 1972, Ser. No. 310,471

Int. Cl. H03f *1/36*

U.S. Cl. 330—2 **10 Claims**

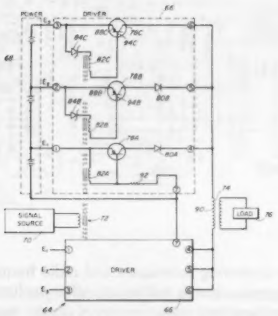


The current of a mass spectrometer collector is indicated by a circuit including an electrometer tube having a control grid connected to the collector. The electrometer tube is included in a d.c. amplifier having a negative feedback path including a very high valued resistor directly connected to the control electrode so that the collector current develops a sufficient voltage to be amplified to a detectable level by the amplifier. Automatic zero and reset control for the amplifier is provided by another d.c. negative feedback loop responsive to the amplifier output. The another negative feedback loop includes an operational amplifier integrator having an output connected to a screen grid of the electrometer tube. The operational amplifier integrator is selectively connected to the d.c. amplifier output so that when the mass spectrometer responds to a sample the integrator is not responsive to the d.c. amplifier output and the spectrometer current is indicated by a d.c. meter connected to the amplifier output via a variable gain operational amplifier.

3,832,643
MINIMAL DISSIPATION POWER CONTROLLER

Arent H. Kits Van Heyningen, Newport, and Bjorn H. Engelhardt, Barrington, both of R.I., assignors to Raytheon Company, Lexington, Mass.

Filed Sept. 21, 1972, Ser. No. 291,119
Int. Cl. H03f *3/26*
U.S. Cl. 330—15 **10 Claims**

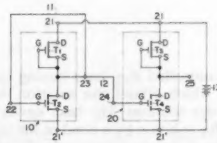


A circuit particularly adapted for use with a transformer-coupled amplifier, such as a push-pull amplifier, for reducing the power dissipated across the amplifying element, typically a transistor, while retaining substantially linear operation of the circuit. The circuit comprises a plurality of branches which may be arranged in either a serial or parallel format, and further comprises means for switching successively increasing amounts of supply voltage or, alternatively, successively decreasing amounts of impedance reflected from a load driven by the circuit. The switching operations occur in response to the instantaneous values of an applied signal voltage, such as a sinusoid, such that several switchings are accomplished during each half cycle of the input sinusoidal signal.

3,832,644
SEMICONDUCTOR ELECTRONIC CIRCUIT WITH SEMICONDUCTOR BIAS CIRCUIT

Minoru Nagata, Kodaira; Takahiro Okabe, Hachio, and Toshiaki Masuhara, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1971, Ser. No. 203,355
Claims priority, application Japan, Nov. 30, 1970, 45-104817
Int. Cl. H03f *1/32*
U.S. Cl. 330—22 **10 Claims**

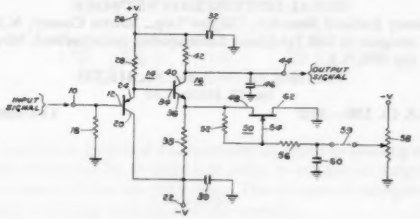


A semiconductor electronic circuit employs a semiconductor bias circuit, in which at least two inverter circuits are provided, each comprising a depletion type MOS transistor and an enhancement type MOS transistor, which are formed on a p-conductivity type semiconductor chip. The depletion type MOS transistor has its gate and source electrodes short-circuited and serves as a load transistor, while the enhancement type MOS type transistor has its drain electrode connected in series to the source electrode of the depletion type transistor. The input terminal and the output terminal of the first inverter circuit are connected to each other, and the voltage obtained at the output terminal is applied as a bias voltage to the input terminal of the second inverter circuit.

3,832,645
WIDE BAND GAIN CONTROL CIRCUIT

Weldon W. Greutman, Hicksville, Ohio, assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed May 11, 1973, Ser. No. 359,386
Int. Cl. H03g *3/30*
U.S. Cl. 330—29 **3 Claims**

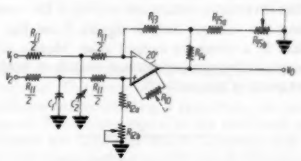


The gain of a complementary Darlington circuit is controlled by a symmetrical field effect transistor to provide a wide band amplifier having a constant direct current reference voltage for output signal at various levels of gain. A pair of PNP-NPN Darlington stages are connected to eliminate the normal emitter-base junction offset voltages. The FET is connected to the emitter circuit of the output stage with feedback between the drain and gate electrodes to provide a constant linearized emitter resistance at each gain control setting.

3,832,646
COMMON MODE NOISE SUPPRESSING CIRCUIT ADJUSTMENT SEQUENCE

Andras I. Szabo, Export, and Ricardo A. Diaz, Plum, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1972, Ser. No. 295,616
Int. Cl. H03g *1/00*
U.S. Cl. 330—30 D **2 Claims**



A circuit is disclosed for suppressing common mode signals of relatively high amplitude. Illustratively, the common mode suppression circuit includes an operational amplifier having a specified operating range and an input network for attenuating the input signal to a degree that the largest expected common mode signal is attenuated so as not to exceed the specified operating range of the operational amplifier. Further, the gain of the operational amplifier is adjusted by a further, output network to compensate for the attenuation im-

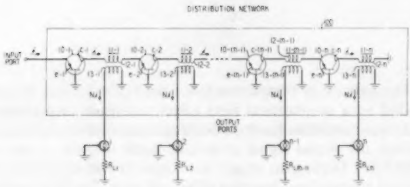
parted to the input signal by the input network. In an illustrative embodiment of this invetion, the input network includes a voltage dividing network for attenuating the input signal and capacitive elements for blocking impulsive, common mode noise of very high amplitude and short duration. In one illustrative embodiment of this invention, the second network for controlling the gain of the operational amplifier includes at least first and second resistive elements connected in series between the output and an input of the operatinal amplifier and a third resistive element connected from the common point therebetween, to ground.

3,832,647

SIGNAL DISTRIBUTION NETWORK

Henry Richard Beurrier, Chester Twp., Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 13, 1973, Ser. No. 415,333
Int. Cl. H03h *7/48*
U.S. Cl. 330—30 R **11 Claims**



This application discloses a distribution network for coupling between a common signal source and a plurality of output loads. One embodiment of such a network comprises a plurality of *n* transistors and an equal plurality of two-winding transformers. The transistors are connected in the common base configuration with the collector of each of the first *n*-1 transistors being connected to the emitter of the next adjacent transistor through the primary winding of a different transformer. The collector of the nth transistor is connected to signal ground through the primary winding of the nth transformer. In accordance with one application of the invention, each secondary winding of the respective transformers is connected to a different output load. In accordance with another aspect of the invention, means are provided for constructively recombining the various output signals from the respective transformers in a common output load. Means are also disclosed for providing an impedance match at both the input and output ports of the network.

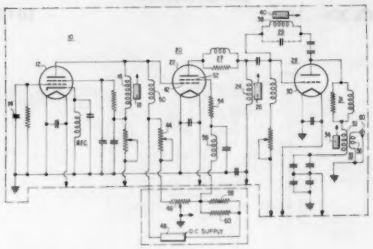
3,832,648

RADIO FREQUENCY POWER GENERATOR UTILIZING NON-MAGNETIC SLUG TUNED COILS AND IMPEDANCE MATCHING NETWORK FOR USE THEREWITH

Robert Bruce McDowell, No. 2 Chestnut Ln., Metuchen, N.J. 08840

Filed May 29, 1973, Ser. No. 364,265
Int. Cl. H03b *5/10, 5/34*
U.S. Cl. 331—74 **9 Claims**

A radio frequency dielectric power generator and associated impedance matching network that requires only initial tuning at the time of manufacture, and will operate into a wide range of load impedances with no tuning required during operation. The equipment is readily adaptable to radio



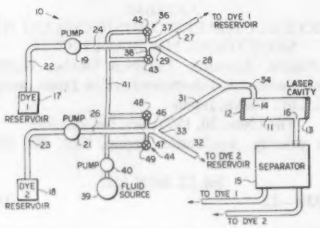
frequency sputtering techniques and radio frequency dielectric heating processes as well as any other applications requiring a radio frequency power supply of crystal controlled fixed frequency, such as communications, R.F. bias deposition, etc.

3,832,649

FLUIDALLY CONTROLLED DYE LASER

John D. Feichtner, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 15, 1973, Ser. No. 360,697
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 L **7 Claims**

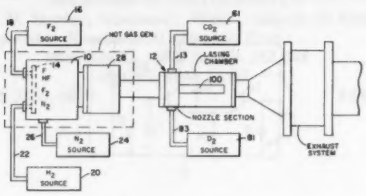


A fluidally controlled dye laser having at least one laser cavity through which a laser dye solution flows and at least one source of dye solution. The laser cavity is connected to the source of dye solution by a conduit having an inlet nozzle connected to the dye source and a pair of outlet channels, one of which is connected to the cavity. The conduit is designed to provide a flow from the inlet nozzle to either outlet channel that conforms to the Coanda effect. Positioned ahead of the junction or splitter of the inlet nozzle and outlet channels are a pair of fluidic control nozzles transversely positioned with respect to the flow of dye solution from the inlet nozzle for switching the flow of solution from one outlet channel to the other. The control nozzles are connected to a source, preferably pressurized, of control fluid and means for controlling the flow of fluid from said nozzles.

3,832,650
SUPERSONIC CHEMICAL TRANSFER LASER

Thomas G. Roberts, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 4, 1973, Ser. No. 421,569
Int. Cl. H01s 3/09, 3/22
U.S. Cl. 331—94.5 P 3 Claims

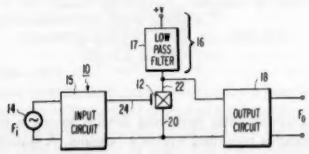


A laser having a gas generating section that delivers a flow of high pressure high temperature gas which contains a large concentration of active fluorine atoms (F) to a nozzle. This gas is expanded through a nozzle to achieve low pressure low temperature supersonic flow which still contains the large concentration of the active atoms. The nozzle includes one set of injection ports positioned so as to inject cold carbon dioxide gas (CO_2) into the flow at a point in the nozzle where the flow is supersonic, just downstream of the throat; and another set positioned so as to inject deuterium (D_2) into the flow after the CO_2 has mixed with the fluorine containing flow, just at the nozzle exit plane. All gases exhaust from the nozzle into a lasing chamber wherein the energy of $F + D_2$ reaction which initially appears as vibrational energy in the product DF molecule is transferred in collisions to the CO_2 molecule. Thus producing a total inversion in the CO_2 which allows the energy to be extracted as a laser beam from the flow.

3,832,651
DYNAMIC DIVIDING CIRCUIT FOR DIVIDING AN INPUT FREQUENCY BY TWO

Subrahmanyam Yegna Narayan, Belle Mead, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jan. 19, 1973, Ser. No. 325,071
Int. Cl. H03b 3/08, 7/14
U.S. Cl. 331—107 G 14 Claims

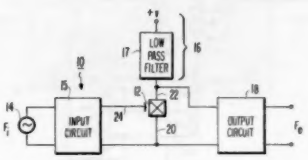


A circuit is presented which has the capability of dividing an input frequency by an integer in order to achieve an output frequency within a specified range. This dynamic dividing circuit is capable of multi-gigabit rate operation.

3,832,652
DYNAMIC DIVIDING CIRCUIT FOR DIVIDING AN INPUT FREQUENCY BY AT LEAST THREE

Chainulu Lakshiminarasimha Upadhyayula, East Windsor, and Subrahmanyam Yegna Narayan, Belle Mead, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 19, 1973, Ser. No. 325,072The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.
Int. Cl. H03b 3/08, 7/14
U.S. Cl. 331—107 G 14 Claims

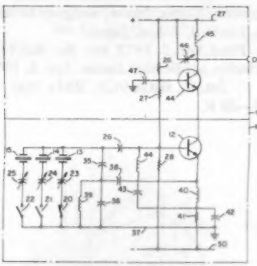


A circuit is presented which has the capability of dividing an input frequency by an integer in order to achieve an output frequency within a specified range. This dynamic dividing circuit is capable of multi-gigabit rate operation.

3,832,653
LOW NOISE RF SIGNAL GENERATOR

John L. Nugent, Baltimore, and Harry W. Claypool, Joppa, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 20, 1973, Ser. No. 389,610
Int. Cl. H03b 5/36
U.S. Cl. 331—116 R 10 Claims



A signal generator for generating a high power low noise RF signal is disclosed. The generator includes a low noise crystal control oscillator for generating a relatively low power, low noise RF signal. The output signal of the oscillator is coupled to a high power RF amplifier which amplifies this signal to generate the low noise high power RF signal. The low frequency noise of the oscillator is reduced by a low frequency negative feedback loop in the oscillator circuit. Noise induced into the oscillator circuit by load changes in the power amplifier is reduced by designing the amplifier such that its input impedance is substantially constant for all phase angles of the RF signal.

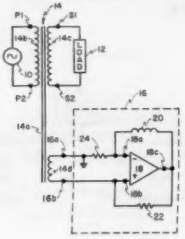
The operating frequency of the generator may be changed by switching the crystal which determines the operating frequency of the oscillator. The bandwidth of the oscillator and the amplifier are such that the operating frequency of the oscillator can be changed over a relatively wide range without circuit readjustments.

3,832,654

COMPENSATED TRANSFORMER CIRCUIT UTILIZING NEGATIVE CAPACITANCE SIMULATING CIRCUIT

Frederick J. Kiko, Sheffield Village, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed Dec. 20, 1973, Ser. No. 426,826
Int. Cl. H03h 7/00, 11/00
U.S. Cl. 333—24 R 18 Claims



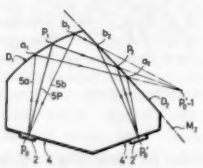
A circuit for reducing or eliminating the effect of the stray capacitance of the windings of a transformer on signals coupled through that transformer. Circuitry is provided for generating voltages and currents which simulate the presence of a negative capacitance and for coupling those voltages and currents to a transformer in cancelling relationships to the stray capacitance thereof. Circuitry is also provided for imposing an upper frequency limit beyond which capacitance cancellation will not occur. The upper frequency limit stabilizes the circuitry and allows signal transmission to be limited to a predetermined desired band of frequencies.

3,832,655

ULTRASONIC DELAY LINE

Takeo Yokoyama, Ebina, Japan, assignor to Mitsumi Electric Company, Limited, Tokyo, Japan

Filed Apr. 5, 1973, Ser. No. 348,114
Claims priority, application Japan, Apr. 6, 1972, 47-33910
Int. Cl. H03h 9/26; H01v 7/00
U.S. Cl. 333—30 R 16 Claims



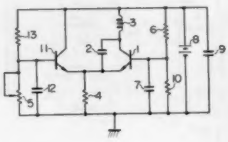
An ultrasonic delay line which comprises a solid body and two input and output electro-mechanical transducers for converting electrical energy into ultrasonic mechanical energy or vice versa, and in which the ultrasonic wave, emitted from the input electro-mechanical transducer by the application of an electric input signal thereto, is reflected by at least one reflecting surface formed in the solid body and enters the output electro-mechanical transducer to derive therefrom an electric output signal which is delayed behind the electric input signal for a period of time during which the ultrasonic wave propagates in the solid body. The reflecting surface has at least one elliptical surface whose focuses are located each at one point on each electro-mechanical transducer or its equivalent point.

3,832,656

TUNING CIRCUIT WHEREIN VARIATION OF TRANSISTOR BASE BIAS CAUSES VARIATION OF RESONANCE FREQUENCY

Tamotsu Ito; Shin-Ichi Ohashi, both of Toyokawa, and Yasuji Miyake, Nagoya, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1973, Ser. No. 414,303
Claims priority, application Japan, Nov. 10, 1972, 47-112754
Int. Cl. H03j 3/18; H03b 5/12
U.S. Cl. 334—14 6 Claims



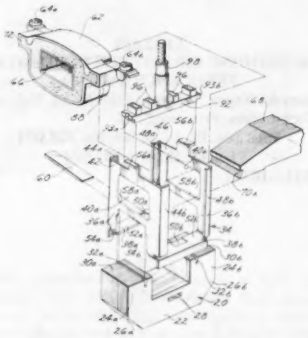
A tuning circuit comprising a first impedance element including a capacitor or inductor and connected between the emitter and collector of a first common-base connection transistor, and a second impedance element inserted between the collector of the first transistor and a power supply for constituting a resonance circuit in combination with the first impedance element, the emitter of the first transistor being grounded through a resistor and the resonance frequency of the resonance circuit being changed by varying the base bias voltage of the first transistor, wherein the emitter of a newly added second common-base connection transistor is connected to the emitter of the first transistor so that the two transistors provide a DC type differential amplifier.

3,832,657

INDUSTRIAL CONTROL RELAY

Dorsey Loraine Hardman, and Philip Goggans Hughes, both of Bloomington, Ill., assignors to General Electric Company, New York, N.Y.

Filed July 30, 1973, Ser. No. 383,685
Int. Cl. H01h 51/30
U.S. Cl. 335—99 20 Claims



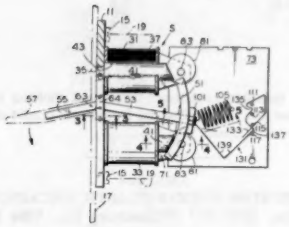
An electromagnetic switching device having a plurality of switch modules mounted within a housing. A stationary magnet is positioned within an opening in an operating coil, and both the magnet and the coil are mounted within the housing. A movable magnet, having a pair of pole faces, is mounted for reciprocal movement between an energized and a deenergized position within the housing. A one piece rigid member is fixed to the pole faces of the movable magnet so as to form a pole shader therefor. The rigid member has rigid arms extending in the direction of movement of the movable magnet for guiding

the movable magnet in the housing between the energized and deenergized positions. Actuator sections extending from the arms of the rigid member at points distant from the pole faces of the movable magnet and cause actuation of the switch modules when the operating coil of the device is energized.

3,832,658
SOLENOID ACTUATED SWITCH

Julian D. Hayden, Vancouver, Wash., assignor to Syndyne Corporation, Vancouver, Washington, Oreg.

Filed July 23, 1973, Ser. No. 382,045
Int. Cl. H01h *21/80*
U.S. Cl. 335—181 **5 Claims**



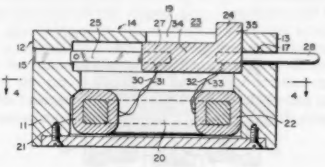
A switch has a manually operated lever which is optionally solenoid operated. A printed circuit board, carrying portions of the solenoid circuit as well as portions of a controlled circuit, is mounted on the solenoid coils by fasteners that also function as adjustable stops for limiting the travel of the lever. These fasteners are so located that they can be adjusted even though in close proximity to other structure, and also located out of the line of mounting screws for the switch, to permit mounting the switch in place without obstruction by the remaining parts of the switch. Permanent magnets are located to effect an overcenter action on the lever, and also to actuate a reed switch on the circuit board. One of the permanent magnets is mounted by a split metal holder to increase magnetic field variation. A shield on the lever shields the reed switch from the magnetic fields of the solenoid coils. A bearing needle on the lever is indented into a mounting plate to provide a long life fulcrum.

3,832,659
PORTABLE TRANSFORMER DEVICE

Callixtus E. Ita, South River, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Aug. 14, 1973, Ser. No. 388,323
Int. Cl. H01f *27/04*
U.S. Cl. 336—107 **2 Claims**

A portable transformer device comprises a housing having opposite substantially parallel sides and a third side joining the opposite sides and substantially perpendicular thereto. One of the parallel sides has a pair of spaced rectangular prong holes formed therethrough. The other of the parallel sides has a pair of spaced circular prong holes formed therethrough. The third side has an elongated slot formed therethrough. A transformer in the housing has a low voltage winding and a high voltage winding. A switch member is slidably mounted in the housing and has a switch arm extending out of the housing through the slot in the third side. The switch member has a pair of rectangular cross-sectioned prongs at one end in operative proximity with the rectangular prong holes in the housing and a pair of circular cross-sectioned prongs at the other end in operative proximity with the circular prong holes in the housing and is movable between a position in which one pair of prongs is in the housing and the other extends through the corresponding prong holes and a position in which the other pair of prongs is

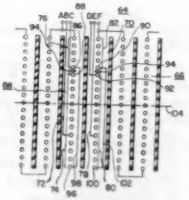


in the housing and the one pair of prongs extends through the corresponding prong holes. Electrically conductive leads electrically connect the low voltage winding of the transformer to the rectangular cross-sectioned prongs and electrically conductive leads electrically connect the high voltage winding of the transformer to the circular cross-sectioned prongs.

3,832,660
TRANSFORMER HAVING AN ELECTRICALLY SYMMETRICAL TAPPED WINDING

Ram R. P. Sinha, Athens, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 20, 1973, Ser. No. 389,611
Int. Cl. H01f *21/12*
U.S. Cl. 336—150 **7 Claims**

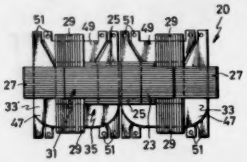


A transformer having a winding which may be tapped without axially moving the electrical center of the winding. The winding includes at least four coil sections, with two of the sections having the same number of turns and the other two sections each having three times that number of turns. The coil sections are arranged in axially adjacent pairs with the lower end of the smaller section directly connected to the lower end of the larger section in a pair of coil sections. Tap leads are connected to ends of the coil sections and across one-third of the turns in the larger coil sections. Tap changing is accomplished by interconnecting the tap leads to tap out equal portions of the winding on both sides of the electrical center line.

3,832,661
TRANSFORMER

Ryoda Sato, 1-8-25, Ohoma-cho, Amagasaki, Japan

Filed Nov. 15, 1972, Ser. No. 306,851
Claims priority, application Japan, Nov. 29, 1971, 46-95346
Int. Cl. H01f 27/24, 27/28
U.S. Cl. 336—212 4 Claims

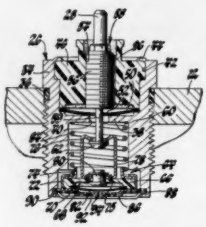


A transformer comprising a specific combination of a seamless iron core portion having formed a completely closed magnetic path and laminated induction plates formed as a primary and a secondary windings, respectively; and a transformer comprising an auxiliary iron core portion which is smaller than the aforesaid iron core portion and intercrossed to the winding of the aforesaid transformer, and said auxiliary winding wound round the auxiliary iron core being adapted to induce therefrom a required small electric power.

3,832,662
VEHICLE COOLING SYSTEM CONDITION MONITOR

Harold A. Haven, Fenton, and John A. Stewart, Flint, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1973, Ser. No. 419,093
Int. Cl. H01h 37/40
U.S. Cl. 337—40 3 Claims

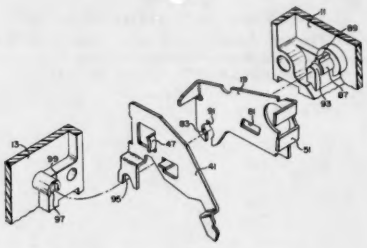


A cooling system condition monitoring apparatus which includes a spring loaded temperature sensitive switch assembly moved by a pressure responsive diaphragm for providing a ground circuit for a warning lamp when the vehicle coolant temperature is above a first preselected level while the cooling system pressure is below a specified level. The apparatus further includes a temperature switch for providing a ground circuit for the warning lamp when the engine is operating above a second predetermined temperature irrespective of the cooling system pressure.

3,832,663
CIRCUIT BREAKER WITH IMPROVED FRAME AND CRADLE SUPPORT MEANS

Francis L. Gelzheiser, Fairfield, Conn., assignor to Westinghouse Electric Company, Pittsburgh, Pa.

Filed Nov. 28, 1973, Ser. No. 419,749
Int. Cl. H01h 71/02
U.S. Cl. 337—112 5 Claims

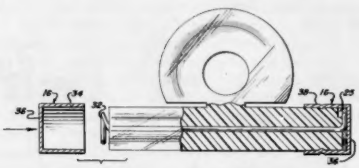


A circuit breaker comprises improved molded insulating support means for supporting the frame and cradle of the circuit-breaker mechanism.

3,832,664
ELECTRIC FUSE THERMOPLASTIC ENCAPSULANT

Gerald Wiebe, 18W 077 Williamburg Ln., Villa Park, Ill. 60181

Filed May 4, 1972, Ser. No. 250,249
Int. Cl. H01h 83/30, 85/14
U.S. Cl. 337—241 20 Claims



An electric fuse including a solid, unitary transparent plastic body having embedded therein a metal fusible link in the form of an elongate wire-like element. The plastic body is in intimate contact with the fusible link to not only provide mechanical support therefor, but also to provide for enhanced heat transfer between the fusible link and fuse body. Opposite ends of the link extend outwardly beyond the ends of the plastic body and are formed into a coiled configuration which is initially spaced slightly from the adjacent body end. A cup-shaped metal end cap is received over each end of the plastic body, and the coiled ends of the fusible link are compressed between an end of the plastic body and an end wall of the end caps, so that the fusible link is in positive electrical and heat-conductive relationship with the end caps. To improve the electrical and heat-conductive relationship between the end caps and the ends of the fusible link, and ends of the fusible link and/or the end caps are coated with a suitable conductive material. The end caps provide heat sinking for not only the fusible link, but also for the plastic body.

The fuse is formed by placing an elongate metal wire in the cavity of a mold, with the end portions of the wire projecting beyond the cavity, and injecting a transparent, fluid plastic material into the cavity to completely surround and encase the

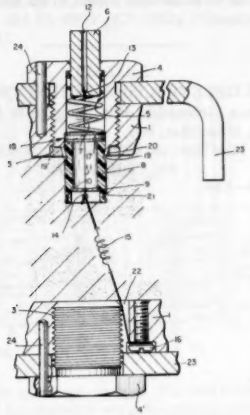
wire and subsequently form a fuse body upon hardening. The outwardly projecting ends of the wire are then bent into a coiled configuration spaced slightly outwardly from the ends of the fuse body, and cup-shaped metal end caps are shifted axially of the fuse body to compress the coiled ends of the fusible link between the end caps and the fuse body after a conductive substance is applied to the ends of the fusible link and/or end caps.

3,832,665

BLOWN FUSE INDICATOR FOR HIGH-VOLTAGE FUSES

Richard A. Belcher, Hampton Falls, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Nov. 16, 1973, Ser. No. 416,526
Int. Cl. H01h 85/32
U.S. Cl. 337—244 **5 Claims**



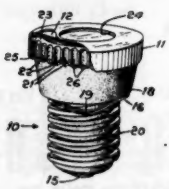
A blown fuse indicator built into a hex-screw and provided with two serially related fusible wire elements of which one is under stress and arranged in a chamber of insulating material forming a void, and the other is wound helically and arranged to be submersed in a body of pulverulent arc-quenching filler.

3,832,666

ELECTRIC FUSE

Richard H. Griffin, Riverside, R.I., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 27, 1973, Ser. No. 383,221
Int. Cl. H01h 85/14
U.S. Cl. 337—272 **6 Claims**



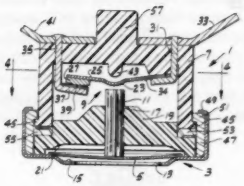
An electric fuse includes a dielectric casing having an explosion chamber and an open end communicating with the chamber, a pair of contacts disposed in the casing, an electric fuse element disposed in the chamber and connected in series with the contacts, and a metallic cap covering the open end. The cap may be apertured and includes a transparent dielectric sheet between the cap and casing to provide a window. The dielectric casing has a plurality of closely spaced alternating longitudinal ridges and grooves along the outer side adjacent the open end extending from the open end toward the base of the casing. The metallic cap tightly covers the open end and is in contact with the ridged side of the casing and includes a rim which is bent inwardly to grip the dielectric casing below the end of the ridges. Upon explosion of the fuse element, gas formed in the explosion chamber temporarily lifts the cap and sheet and escapes past the open end under the cap, with the space between the cap and the grooves providing a path for the gas in the direction away from the open end toward the base of the casing. The improved venting structure permits use of moldable thermosetting plastic materials for the casing.

3,832,667

THERMOSTATIC SWITCH

Bobby D. Blanton, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 23, 1973, Ser. No. 381,959
Int. Cl. H01h 37/52
U.S. Cl. 337—354 **14 Claims**

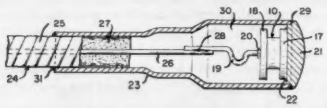


A trip-free manual reset thermostatic switch with a thermostatic element for actuating a switch assembly by means of an actuator. The thermostatic element is mounted for flexing movement on a base and moves from a first to a second position relative to the base in response to predetermined temperature conditions, and then remains in the second position independent of further changes in temperature. The base and thermostatic element are provided with a cover movable toward and away from the base and held captive thereto. A switch assembly is mounted within the cover. This assembly includes a first contact secured to the cover and a contact arm one end of which is also secured inside the cover and having a free end carrying a second contact normally engaged with the first contact but movable out of engagement therewith. When the thermostatic element moves into its second position, the actuator concurrently moves the contact arm to separate the contacts. The cover, when moved from a normal to a reset position relative to said base, moves the actuator to bias the thermostatic element away from its second and toward its first positon, but the contacts will remain separated and the thermostatic element will not move into its first position while said element is subject to the predetermined temperature conditions. However, the contacts will reclose and the thermostatic element will be moved into its first position in the absence of the predetermined temperature conditions.

3,832,668
SILICON CARBIDE JUNCTION THERMISTOR

Herbert S. Berman, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1972, Ser. No. 239,968
Int. Cl. H01c 7/04
U.S. Cl. 338—22 SD 2 Claims

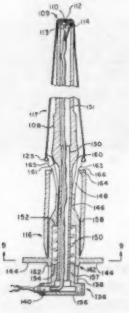


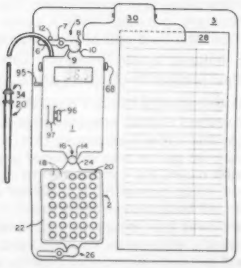
A high impedance, junction thermistor for sensing temperatures from about −200°C. to above 1,400°C. is provided with a semiconductor body of silicon carbide. The silicon carbide semiconductor body has at least first and second impurity regions forming a PN junction therebetween. The temperature is sensed by the impedance response across the PN junction.

3,832,669
TEMPERATURE-SENSING DEVICE

Fritz Kurt Mueller; Billy Otis Martin, and Robert Cherry, all of Huntsville, Ala., assignors to Royal Medical Corporation, Huntsville, Ala.

Continuation-in-part of Ser. No. 62,481, Aug. 10, 1970, Pat. No. 3,729,998, and a continuation-in-part of Ser. No. 173,115, Aug. 19, 1971. This application June 1, 1972, Ser. No. 258,728
Int. Cl. H01c 7/00
U.S. Cl. 338—28 18 Claims



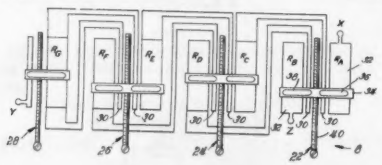


A temperature sensing probe-and-sheath assembly, especially adapted for use in an electronic thermometer but having utility in temperature control and temperature compensation devices, comprising: a probe element of plastic or other material of low heat conductivity, having a handle portion, connectible to a source of electricity, a tip portion and a central channel extending from said handle portion to the tip portion, a piece of metal foil or very thin metal sheet, of high heat conductivity, fixed to said tip portion and extending across a probe-tip widened portion of said channel that forms a narrow endless ridge, losing little of the measured heat, at the tip of the probe; a pre-heating thermistor and a temperature-measuring thermistor, fixed by metal-comprising bonding material to the foil; wiring in the channel between the handle and tip portions, connected to said thermistors; a probe sheath having a blunt tip end snugly engaging the foil, extending over a narrow, endless tip-end ridge of said plastic and ending at a sheath-holding enlarged portion of the probe, with an air-filled clearance between the probe element and sheath along a major part of the probe element's length; and means at the handle portion to cause said sheath to be removed from the enlarged portion.

3,832,670
MULTIPLE PRECISION POTENTIOMETER

Gary F. Oman, Greensdale, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Nov. 16, 1972, Ser. No. 306,910
Int. Cl. H01c 1/16
U.S. Cl. 338—124 3 Claims

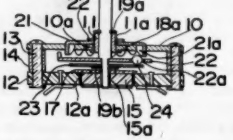


A wide range and high resolution potentiometer is provided by using a plurality of variable resistor pairs and a base potentiometer. The pairs are connected together in two complementary series chains on either side of the base potentiometer. A slide means is connected to each pair in a ganged relation to selectively vary their resistance in equal but opposite direction so that the total input resistance of the potentiometer always remains constant. Each pair added multiplies the basic resolution of the potentiometer.

3,832,671
STEP-BY-STEP VARIABLE RESISTOR ASSEMBLY

Tatsuo Kohima, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto-fu, Japan

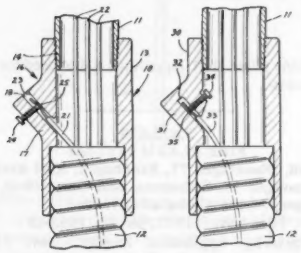
Filed Jan. 24, 1973, Ser. No. 326,522
Claims priority, application Japan, May 12, 1972, 47-55918[U]
Int. Cl. H01c 9/04
U.S. Cl. 338—188 8 Claims



A step-by-step variable resistor assembly of compact and simplified construction essentially comprising an operating

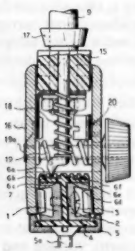
shaft, a mounting panel and base plate connected with each other in spaced relation to each other, both rotatably carrying the operating shaft, a tap member carried by the operating shaft within a space between the mounting panel and the base plate, a detent device for providing detent positions for rotation of the operating shaft, terminal members of the number corresponding to the number of the detent position, and a film of resistance material arranged in a substantially split-ring shape and electrically connecting the terminal members. Upon rotation of the operating shaft to any one of the detent positions, some or all of the terminal members are shortcircuited to give a definite value of resistance.

3,832,672
GROUNDING COUPLING FOR ELECTRICAL WIRE RACEWAYS
John R. Loos, 2801 Maple St., Fargo, N. Dak. 58102
Filed Apr. 2, 1973, Ser. No. 347,390
Int. Cl. H01r *3/06*; **H02g** *3/06*
U.S. Cl. 339—13 **5 Claims**



A coupling for raceways, such as thin wall conduit (EMT) or rigid conduit for electrical wires for joining such conduit to another type of raceway, and incorporating a grounding terminal integrally with the coupling to permit connection of an internal grounding wire.

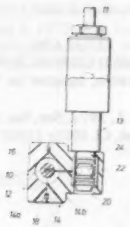
3,832,673
CONDUCTING RAIL AND ADAPTER FOR SUPPLYING ELECTRICAL APPLIANCE
Helene Marie Le Hir, Blanc-Mesnil, France, assignor to Maurice Soquenne, Neuilly-Sur Marne, France
Filed Feb. 16, 1973, Ser. No. 333,160
Int. Cl. H01r *9/00*
U.S. Cl. 339—21 R **6 Claims**



A low-voltage conducting rail and adapter assembly acting at the same time as a mechanical support for lighting spots and other electrical appliances.

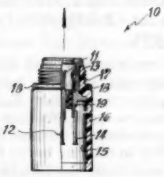
The adapter comprises two rigid conducting arms forming a clamp on the two U-sections of which the rail is made, and an insulating member linking the conducting arms and being part of the fixing arrangement for the electrical appliance.

3,832,674
ELECTRICAL CONNECTOR
Eugene F. Florian, Houston, Tex., assignor to Mark Products, Inc., Houston, Tex.
Filed Dec. 11, 1972, Ser. No. 313,789
Int. Cl. H01r *13/52*
U.S. Cl. 339—60 R **12 Claims**



A plug and socket type connector is disclosed that provides a fluid proof electrical connection. The plug member includes a body with contacts located on opposite sides of the body with seal members on each side of the contacts that wipe the socket as the plug is pushed into the socket and seal the plug and socket contacts from the ambient fluid when the contacts are in engagement. The socket contact forms a portion of the wall of the socket opening. The plug contacts are balls located in an opening that extends transverse the body. The balls extend out of the openings far enough to engage the socket contact. A coil spring located between the balls hold the balls against the socket contact and electrically connects the balls to the plug body.

3,832,675
ELECTRODE COMPRISING A HEAD AND A DETACHABLE PLUG
Manfred F. Detemple, 65 Mainz, Josefstr. 65, Mainz; Horst Hubner, 6203 Hochheim, Herderstr. 8, Hochheim, and Johann Oswald, 65 Mainz, Sommerringplatz 6, Mainz, all of Germany
Filed Oct. 12, 1972, Ser. No. 296,968
Claims priority, application Germany, Mar. 3, 1972, 7208139
Int. Cl. H01r *13/46*
U.S. Cl. 339—143 R **1 Claim**



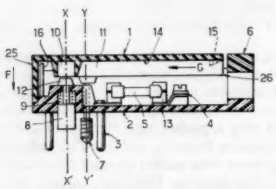
A connection between an electrode head and a cable plug to form an electrode plug head. The connection is a good electrical connection of a first contact and a second contact coaxially arranged about the first contact of the electrode head

respectively with an inner terminal and an outer terminal of the cable plug similarly arranged. Further, a plastic casing enveloping the whole unit of electrode head clampingly engages another plastic casing enveloping the entire cable plug. The casings cause simultaneous engagement of an outer thread and an o-ring of the electrode head respectively with an inner thread and a shoulder of the cable plug. Thus, a fluid-proof electrode plug head is obtained. The electrode head is also provided with a thin metallic shield which is slidably mounted on the inner wall of the plastic casing and which is electrically connected to the second contact to serve as an electric shield so that the electrode plug head will be leak-proof when the electrode head and the cable plug are connected.

3,832,676
FUSED CONNECTOR

Jean Joly, Houilles, France, assignor to "La Telemecanique", Nanterre, France

Filed Nov. 1, 1972, Ser. No. 302,740
Int. Cl. H01r *13/68*
U.S. Cl. 339—147 P **5 Claims**



Fused connector only allowing access to the fuses when the terminals are not live.

A piston locks a sliding cover or prevents the connector from being put in position.

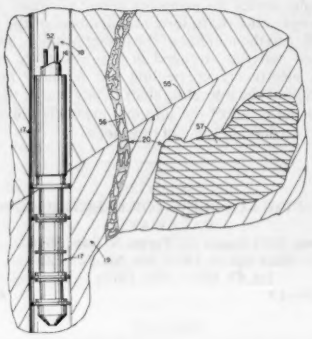
The connector may be used in conjunction with prefabricated electric wirings having a plurality of plugs arranged along their length.

3,832,677
SCANNING MID FREQUENCY ACOUSTICAL PROSPECTING METHOD

Byron B. Brenden, Richland; Victor I. Neeley, and George F. Garlick, both of Kennewick, all of Wash., assignors to Holosonics, Richland, Wash.

Continuation of Ser. No. 31,306, April 23, 1970, abandoned. This application Aug. 2, 1973, Ser. No. 384,913
Int. Cl. G01v *1/28, 1/40*
U.S. Cl. 340—15.5 TN **4 Claims**

A method of transmitting sound from a bore hole and thereafter receiving and analyzing its reflections to define finer geologic structure, particularly faults and ore bodies, at distances up to two hundred-fifty feet from the bore hole. Acoustical energy between 100 and 1,000,000 cycles per second is transmitted in discrete bursts from multiple, spaced points along the bore hole; the reflections from boundaries defining material of differing acoustical impedance are received and coherently analyzed to determine time of transit of the acoustical energy, phase shift if any, and strength of the reflection to define parameters of the reflecting interface. Multiple analysis may be carried out in plural drill holes or at spaced points in one drill hole to uniquely define position of acoustically differing interfaces. Analysis may be simplified and definition made finer by directionalizing the searched area, time-gating the returned signal and coherently analyzing

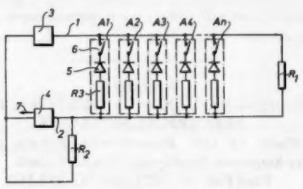


it to determine phase shift. Apparatus is disclosed for carrying out the process.

3,832,678
FIRE ALARM SYSTEM

Bjorn Gysell, Dianavagen 77, Bandhagen; Karl Axel Nilsson, Kruthornsvagen 17, Sollentuna, and Gary Nilvid, Skebokvarnsvagen 174, Stockholm, all of Sweden

Filed Nov. 5, 1971, Ser. No. 196,045
Claims priority, application Sweden, Nov. 12, 1970, 15288/70
Int. Cl. G08b *21/00*
U.S. Cl. 340—227 R **9 Claims**



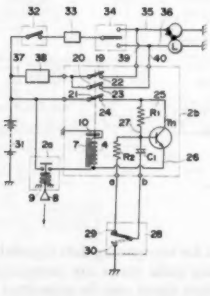
A fire alarm system including a plurality of individual alarm devices connected to a two-wire electrical loop, each alarm device including a unidirectional current conducting means, a resistive impedance, and a switch adapted to move to an actuated position in response to fire detection. Also included in the loop are a bi-directional voltage source, a passive load having a predetermined value, and a resisitve impedance element also of a predetermined value, said plurality of alarm devices and the passive load forming one portion of a voltage divider, the other portion of the voltage divider being formed by the resistive impedance element. A fire alarm signal can be distinguished from all other signals generated by the system, in that under normal operation, the voltage drop across the resistive impedance element is not altered in response to the application of a first polarity voltage and then a second polarity voltage, while in response to the detection of a fire, a switch in an alarm device assumes its actuated position, whereby the voltage drop across the resistive impedance element assumes a first value in response to a first polarity voltage and a second value different from the first value in response to a second polarity voltage. In response to other abnormal conditions,

such as ground leakage between the wires of the loop, the potential drop across the resistive impedance element remains the same for both polarity voltages.

3,832,679
HIGHWAY EMERGENCY COMMUNICATIONS-WARNING SYSTEM AND UNITS
Dennis J. Foley, and Richard A. Gilmore, both of Columbus, Ohio, assignors to Design Properties, Inc., Wellston, Ohio
Filed Aug. 16, 1972, Ser. No. 281,143
Int. Cl. G08g *1/09*
U.S. Cl. 340—22 **6 Claims**

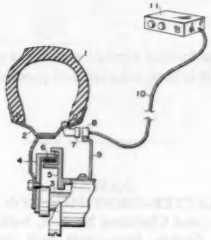
A highway warning system is comprised of a plurality of standards erected at regularly-spaced intervals along the road side and interconnected by conventional telephonic system to a central dispatcher station. The standards are provided with communication elements and a light which is under control of the central station such that the standard at the closest point to a trouble site may be illuminated and as well standards ahead of the trouble point may be illuminated to warn motorists of potential danger ahead.

3,832,680
HAZARD WARNING SIGNAL DEVICE FOR USE IN AUTOMOTIVE VEHICLE
Masaru Suzuki, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi-ken, Japan
Filed Nov. 29, 1971, Ser. No. 202,972
Claims priority, application Japan, Nov. 28, 1970, 45-104996
Int. Cl. B60q *1/26*
U.S. Cl. 340—56 **9 Claims**



A hazard warning signal device for use in automotive vehicles including an actuator controlling at least one switch for closing directly or indirectly a load circuit for simultaneously flashing a plurality of vehicle lamps to indicate a hazardous condition, as well as closing a control circuit. The control circuit is responsive to detecting switch means detecting the starting or motion condition of the vehicle from a stopped position for releasing the at least one closing switch.

3,832,681
PRESSURE CHANGE DETECTING SYSTEM FOR ROTATING BODY
Masaaki Kaida, and Shigeo Yasuda, both of Tokyo, Japan, assignors to Bridgestone Tire Company Limited and Mitaka Instrument Company Limited, both of Tokyo, Japan
Filed May 4, 1973, Ser. No. 357,514
Claims priority, application Japan, May 13, 1972, 47-47326
Int. Cl. B60c *23/04*
U.S. Cl. 340—58 **7 Claims**

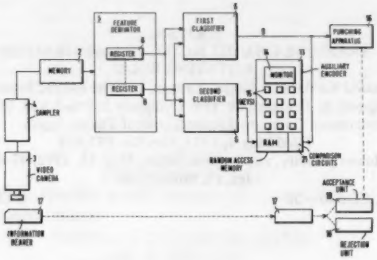


A pressure change detecting system for detecting change of pressure of pressurized gas confined in a chamber of a rotating body, which comprises a detector adapted to be mounted on the rotating body and including a magnet carrier plate carrying thereon a permanent magnet and a weight member, the magnet carrier plate being rotatable in accordance with centrifugal force applied to the weight member due to the rotation of the rotating body, and lock means for allowing the magnet carrier plate together with the magnet to upset only when the pressure of the pressurized gas changes over a predetermined extent, an electro-motive element so positioned as to face the orbital plane of the detector for producing an electro-motive force in accordance with variation of a magnetic field established therein due to the rotation of the detecting assembly, and processor for processing the electro-motive force so as to produce pressure change information signal in accordance with the electro-motive force.

3,832,682
READING APPARATUS
Wilhelm Fredrik Brok, Voorburg; Arie Adriaan Spanjersberg, Leiderdrop, and Joannes Van Staveren, Zoetermeer, all of Netherlands, assignors to De Staat Der Nederlanden ten deze vertegenwoordigd door de Directeur-Generaal der Posterijen, Telegrafie & Telefonie, The Hague, Netherlands
Filed July 19, 1972, Ser. No. 273,332
Claims priority, application Netherlands, July 22, 1971, 7110114
Int. Cl. G06k *5/00, 15/20*
U.S. Cl. 340—146.3 ED **11 Claims**

A reading apparatus for processing symbols handwritten on a recording card in combined mechanical and manual fashion, in which the mechanical automatic reading is by recognition logic for classifying the symbols read, and the symbols that are not so recognized or are uncertain are visualized on a central monitor. Thus a second classification device is provided by

means of which an unrecognized symbol can be converted into uncertainty indications, and with an auxiliary encoding device having a monitor for the symbol and a manual keying device for the symbol viewed on the monitor, a comparison is made with this keyed symbol and the two closest classified



logic indications for that symbol, and if one corresponds to the keyed symbol, it is then selected and processed in the reading machine.

3,832,683

CHARACTER-IDENTIFICATION DEVICE

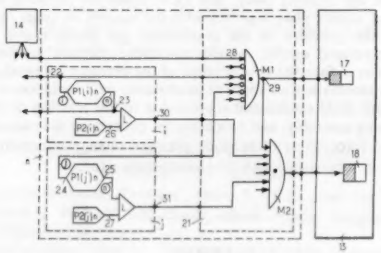
Morton Nadler, and Christian Masson, both of Paris, France, assignors to Societe Honeywell Bull (Societe Anonyme), Paris, France

Filed June 20, 1973, Ser. No. 371,902

Claims priority, application France, June 30, 1972, 72.23669

Int. Cl. G06k *9/12*

U.S. Cl. 340—146.3 MA **14 Claims**



A character identification device which enables the identification of defective printed characters is designed to be part of a recognition system for printed characters.

This device includes a number of identification circuits equal to the number of character patterns which are validated by a validating and global centering circuit, and the two outputs of which are connected to a decision circuit, for a first level of decision in favor of one character pattern given by a global analysis of the character to be recognized from a set of discrimination circuits included in each identification circuit, and for a second decision level by a local analysis of the character to be recognized following the global analysis and carried out by the said discrimination circuits.

3,832,684

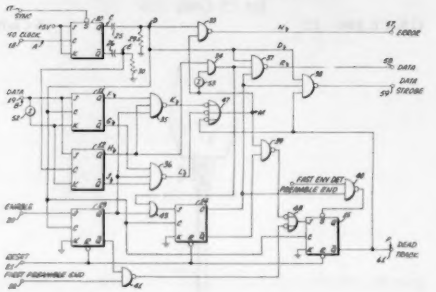
APPARATUS FOR DETECTING DATA BITS AND ERROR BITS IN PHASE ENCODED DATA

Edward R. Besenfelder, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 31, 1973, Ser. No. 411,493

Int. Cl. G06k *5/00*

U.S. Cl. 340—146.1 AB **11 Claims**



A plurality of JK flip-flops, inverters and logic gates provide error signals when errors in phase occur between the phase bits and the data bits of information retrieved from a magnetic medium. The apparatus also provides warning signals when data bits are missing from the retrieved information.

3,832,685

DATA SIGNAL RECOGNITION APPARATUS

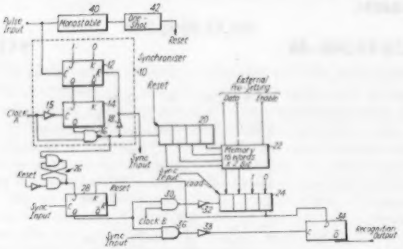
Alan E. Hendrickson, 8 College Gardens, S.E. 21, London, England

Filed Mar. 9, 1973, Ser. No. 339,535

Claims priority, application Great Britain, Mar. 10, 1972, 11366/72

Int. Cl. G06f *7/02*

U.S. Cl. 340—146.2 **8 Claims**

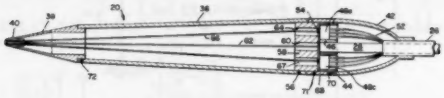


In apparatus for recognising data signals in the form of pulse trains, incoming pulse trains are compared with stored data and a recognition signal may be generated not only for an incoming pulse train exactly equivalent to that represented by the stored data but also for incoming pulse trains representing more specific forms of the stored data.

3,832,686
BAR CODE FONT

Ilhan M. Bilgutay, 2440 Dupont Ave. S., Minneapolis, Minn. 55405

Division of Ser. No. 118,771, Feb. 25, 1971, Pat. No. 3,744,025. This application May 11, 1972, Ser. No. 252,335
Int. Cl. G06m 9/18
U.S. Cl. 340—146.32 17 Claims

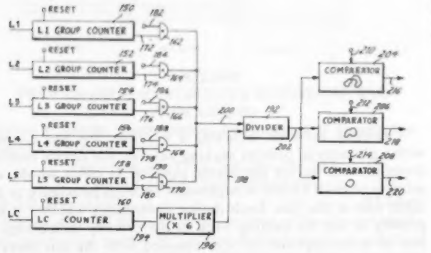


An optical character reading system comprising a hand-held probe device for scanning a printed font to produce an output adapted for driving a printed readout display or producing digital inputs to data storage or computing apparatus. The font is comprised of bar code symbols which can form humanly recognizable alpha-numeric characters. At the tip of the probe device are means for transmitting a bright light and means for receiving reflected light at spaced apart windows. The light receiving means of each window is connected to an electrical signal producing element so that as the device scans over a series of characters, each window "sees" the reflective and non-reflective areas and output signals are produced which provide information as to the relative locations of reflective and non-relective areas and also the number of non-reflective edges passed during scanning and these signals provide input data to logic circuitry that includes means for compensating for variations in the direction of scanning or orientation of the probe with respect to the character block; means for identifying variables and characters of the printing font and for producing and storing representative data outputs and also error-checking components for assuring the accuracy of the data outputs.

3,832,687
PATTERN RECOGNITION SYSTEM

Melvin N. Miller, Wynnewood, and Marshall S. Levine, Wayne, both of Pa., assignors to Geometric Data Corporation, Wayne, Pa.

Continuation of Ser. No. 117,996, Feb. 23, 1971, abandoned. This application July 3, 1973, Ser. No. 376,246
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 MA 26 Claims

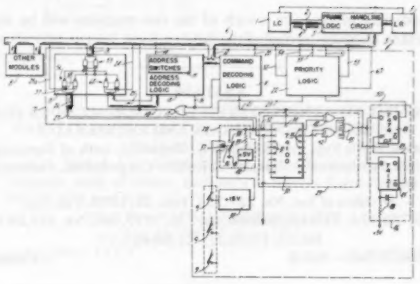


A pattern recognition system is provided having storage means which includes a plurality of stages for storing quantized signals generated by scanning a field. The pattern recognition system includes a pattern detection means. The detection means is connected to the output of a plurality of stages of the storage means and also includes counting means for determining the number of times a predetermined event occurs in said storage means.

3,832,688
STATUS SENSING AND TRANSMITTING CIRCUIT

Lawrence J. Strojny, West Allis, and Paul H. Froehling, Franklin, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Dec. 15, 1972, Ser. No. 315,573
Int. Cl. H04q 5/00
U.S. Cl. 340—147 R 16 Claims



A contact status sensing circuit monitors a plurality contact means and generates a signal in response to a status change. The circuit forms a point module in the remote station of a communication loop system having a central controller to generate message frames having address and command binary coded bits. The module includes an address encoding means to fill a frame and an address decoding means to generate an enable signal to respond to a properly addressed frame. A contact storage register had related inputs-outputs for each contact and a comparator logic gate compares such inputs-outputs to generate a signal. The individual comparator gate outputs are combined and actuate a flip-flop circuit and pulse circuit to complete the setting of the flip-flop circuit. The module obtaining a message frame, inserts its address and the contact status. The controller acknowledges receipt of such information and generates a clear frame which updates the register, clears the interrupt and again places the latest contact status on the output bus lines. The monitored contacts are isolated by connection to a reed relay coil connected to an isolated power supply. The reed relay contacts are connected in a logic network connected to the input of the register and to the bus lines.

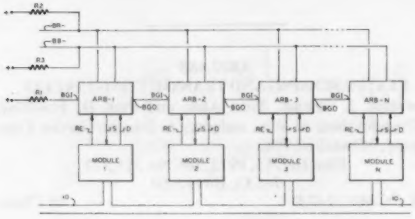
3,832,689
DATA-TRANSMISSION APPARATUS

David K. Means, Ann Arbor, and Thomas M. Luther, Saline, both of Mich., assignors to Reliance Electric Company, Ann Arbor, Mich.

Filed Sept. 6, 1973, Ser. No. 394,739
Int. Cl. H04q 5/00
U.S. Cl. 340—147 LP 12 Claims

In a system wherein plural data-handling modules are connectable to time-share a data bus, determination of which module may control the bus at any given instant is made by a plurality of simple conflict-resolving circuits which are associated with respective modules so as to allow economical

expansion of the data-handling system. If two modules request control while a third module is using the bus, a decision is immediately made as to which of the two modules will be the next to be given control of the bus.



3,832,690

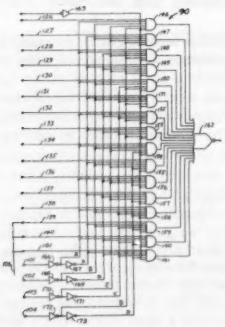
COMMUNICATIONS SYSTEM ENCODER-DECODER FOR DATA TRANSMISSION AND RETRIEVAL

David S. McVoy, and Richard G. Reynolds, both of Sarasota, Fla., assignors to Coaxial Scientific Corporation, Sarasota, Fla.

Division of Ser. No. 227,752, Feb. 22, 1972, Pat. No. 3,786,424. This application Apr. 30, 1973, Ser. No. 355,885

Int. Cl. H03k 21/12; H04q 5/14

U.S. Cl. 340—168 R **2 Claims**



A communications system, such as a cable television system, embodies an arrangement for data transmission which utilizes a combination of time and frequency division. Groups of data transmitters are connected to data retrieval circuitry through switch circuits which are selectively addressed by a predetermined code to provide communication between all of the data transmitters of the group and data retrieval circuitry. The transmission of data from transmitters in the other groups are blocked until the appropriate address code is sent to the associated switch circuit. Circuitry utilizing a synchronous or non-synchronous clock is provided for generating a message marker along with the data pulse train.

3,832,691

ELECTRIC MODEL MOTOR CONTROL

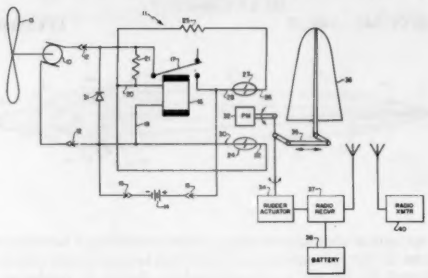
Frank A. Galler, P.O. Box 87, South Walpole, Mass. 02081

Filed June 20, 1973, Ser. No. 371,856

Int. Cl. H04b 7/00

U.S. Cl. 340—171 R **7 Claims**

A motor control for connecting an energy source to an electric power motor of a model in which the on and off operation of said power motor is effected by electrically activatable switching responsive to a radio signal and a voltage sensing circuit which opens the circuit automatically when the voltage of the energy source drops below a predetermined level.



In one particular utilization two switches actuated by extreme operation of an independent radio controlled element such as an airplane rudder provide on-off control operation of the propeller drive motor.

3,832,692

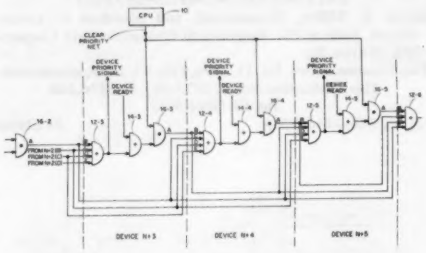
PRIORITY NETWORK FOR DEVICES COUPLED BY A MULTI-LINE BUS

Russell A. Henzel, Ann Arbor, Mich., and Byron G. Gayman, Holliston, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed June 27, 1972, Ser. No. 266,768

Int. Cl. G06f 9/18

U.S. Cl. 340—172.5 **12 Claims**



A priority network including a multiple line bus coupled with a plurality of priority seeking devices, the device furthest down the bus having the lowest priority. In other words, the priority of each device is dependent upon its proximity to the input end of the bus. Each device determines whether it has priority or not by looking back at the priority indications of two or more previous devices coupled with the bus thereby decreasing the time required for a given device to gain access with a processor coupled with the bus. Means are also provided for clearing the priority indications of each of the plurality of devices, once a device has gained access with the bus and processor, thereby increasing the speed for clearing the priority network.

3,832,693
SYSTEM FOR READING OUT THE COORDINATES OF INFORMATION DISPLAYED ON A MATRIX TYPE DISPLAY DEVICE

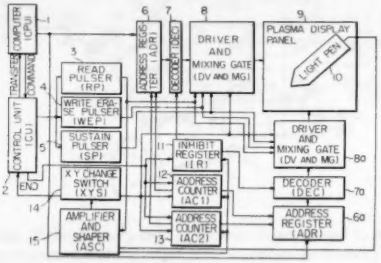
Hiroyuki Ishizaki, Akashi; Teruo Toba, Kakogawa, and Shozo Umeda, Hyogo, all of Japan, assignors to Fujitsu, Limited, Kanagawa-ken, Japan

Filed Aug. 21, 1972, Ser. No. 282,022

Claims priority, application Japan, Aug. 29, 1971, 46-66052; Oct. 28, 1971, 46-85830

Int. Cl. G08c *21/00*

U.S. Cl. 340—172.5 **5 Claims**



For reading out the coordinates of information on a matrix type display, a read pulse scans the display surface. In the first embodiment, the display surface is divided into a plurality of blocks in both X and Y directions. First, the scanning is carried out with regard to the blocks in the X direction. Second, when an information signal is detected in any block, the above-mentioned operation is repeated with regard to the Y direction, and the coordinates of the information signal can be read out. In the second embodiment, the display surface is divided into 2 blocks in both X and Y directions and the scanning is first carried out with regard to the two blocks in the X direction. When the information signal is detected in one of the two blocks, the block is further divided into two blocks. By repeating this process, the electrode which includes the information signal is detected. Secondly, the above-mentioned operation is repeated with regard to the Y direction, and the coordinates of the information signal can be read out. Further, in the abovementioned two embodiments, the coordinates can be read out whether the coordinates are in the fired cell or in the non fired cell without carrying out special operations.

3,832,694
PROCESSOR UNIT FOR DATA RETRIEVAL AND PROCESSING

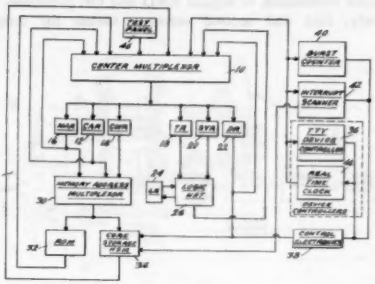
Vincent J. Judith, Southampton, Pa., assignor to Excello Corporation, Detroit, Mich.

Filed Aug. 31, 1972, Ser. No. 285,237

Int. Cl. G08c *15/00*; **H04j** *3/00*

U.S. Cl. 340—172.5 **8 Claims**

A data retrieval and processing system relies upon a center multiplexor and a memory address multiplexor in a system of registers and data processing means to both feed and receive both process information and operational data using internal programming stored within at least one memory and simple input control words and data, in response to which the center multiplexor provides internal switching between said aforementioned sources to provide information output. Priority selection is provided in servicing terminals and gives immediate exclusive attention and direct memory access to a particular urgent need exhibited through a selected control electronics.



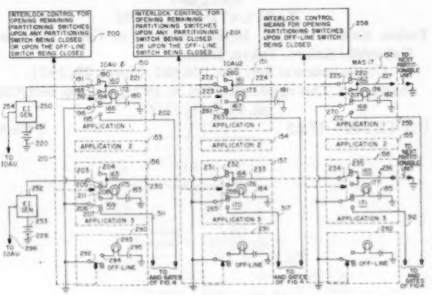
3,832,695
PARTITIONING CIRCUIT EMPLOYING EXTERNAL INTERRUPT SIGNAL

Frank C. Nickel, New Brighton, and James R. Swanson, Minneapolis, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 6, 1972, Ser. No. 304,172

Int. Cl. G06f *9/18*, *13/00*

U.S. Cl. 340—172.5 **6 Claims**


INTERLOCK CONTROL FOR OPENING REMAINING PARTITIONING SWITCHES UPON ANY PARTITIONING SWITCH BEING CLOSED OR UPON THE OFF-LINE SWITCH BEING CLOSED
INTERLOCK CONTROL FOR OPENING REMAINING PARTITIONING SWITCHES UPON ANY PARTITIONING SWITCH BEING CLOSED OR UPON THE OFF-LINE SWITCH BEING CLOSED
INTERLOCK CONTROL MEANS FOR OPENING PARTITIONING SWITCHES UPON OFF-LINE SWITCH BEING CLOSED
APPLICATION 1
APPLICATION 2
APPLICATION 3
OFF-LINE

Disclosed is a first switching means for combining and changing partitionable units in a data processing system to form partitioned systems each of which is assigned to a given application such as real time, batch or maintenance, and a second switching means coupled to said first switching means so that each time a partitioning change is made by said first switching means, the second switching means will be switched to generate an EI signal to automatically notify the processor of such change so that the necessary adaptive changes can be made without human intervention.

3,832,696
GENERAL PURPOSE SEQUENCE CONTROLLER

Hisaji Nakao; Katutoshi Naruse; Kazuhiko Hasegawa, all of Toyota; Sadao Kawade; Yasufumi Tokura, both of Kariya, and Kazuo Matsuno, Gifu, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Aichi-ken, Japan

Filed July 23, 1973, Ser. No. 381,622

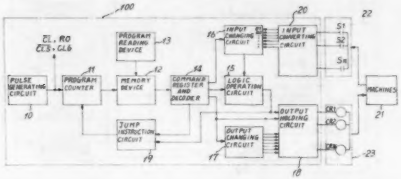
Claims priority, application Japan, July 31, 1972, 47-76721

Int. Cl. G06f *15/46*; **G05b** *11/32*, *1/01*

U.S. Cl. 340—172.5 **5 Claims**

A general purpose sequence controller wherein a schematic electric circuit diagram comprising a ladder network of circuit

lines disposed between two vertical bus lines is changeable and simulated by a special purpose control program. A logic operation circuit comprises first and second circuit means for examining an external input signal in accordance with examine commands of logical AND and OR functions, respectively, first and second memory means for temporarily



memorizing the examined results of the first and second circuit means, respectively, third memory means for temporarily memorizing the application of the examine command of the logical OR function, and identifying circuit means for identifying the examined results of the logic operations in accordance with the contents of the first, second and third memory means.

3,832,697

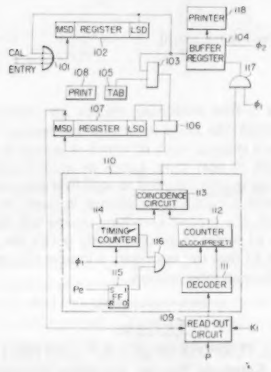
TABULATING SYSTEM

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 128,681, March 29, 1971, abandoned. This application Oct. 4, 1973, Ser. No. 403,526

Int. Cl. B41j *25/18*

U.S. Cl. 340—172.5 **5 Claims**



A tabulating unit is provided with a tabulating register for storing a predetermined tabulating information and a control unit which reads out the tabulating information and in response to the tabulating information, generates counting pulses so that information stored in an operation register may be automatically tabulated in accordance with the counting pulses, that is the preset number of digits may be printed out in each column of an account or the like.

3,832,698

HALOGRAPHIC MEMORY WITH RETRIEVAL BY CORRELATION

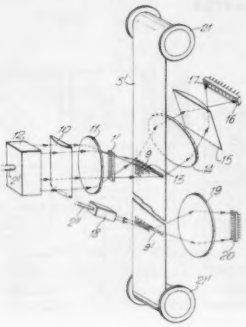
Akira Ishii, Kawasaki, Japan, assignor to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Jan. 12, 1972, Ser. No. 217,157

Claims priority, application Japan, Jan. 20, 1971, 46-1326

Int. Cl. G11c *11/42*; **G02b** *27/00*

U.S. Cl. 340—173 LT **13 Claims**



A method of correlation detection for obtaining a high identification ability in an optical information retrieval system for retrieving desired information from a hologram memory by checking the coincidence matching between an interrogation signal and the hologram memory contents by utilizing the correlation detection function of a hologram, and a device therefor. A coherent laser light is spatially modulated by an interrogating signal in a modulator and the output light of the modulator is deflected to scan the hologram memory. By coding both the interrogation signal and the hologram memory information in a 2 out of N code, an oscillatory output waveform is obtained during the scanning operation when the interrogation signal is coincident with the hologram memory information and a non-oscillatory output waveform is obtained when such a coincidence does not exist. The matching of the interrogating and interrogated information is determined by detecting the existence of an oscillatory waveform in the output signal. The information retrieval system comprises a hologram memory array storing the information to be retrieved, a spatial modulator for modulating laser light by an interrogation signal, a light deflector for scanning the hologram memory array by deflecting the output beam of the spatial modulator, a matching detector for detecting matching output, and high-pass filters for detecting the oscillatory component in the matching output.

3,832,699

MEMORY CONTROL CIRCUIT

Shigeki Matsue, Tokyo, Japan, assignor to Nippon Electric Company Limited, Tokyo, Japan

Filed Sept. 18, 1973, Ser. No. 398,340

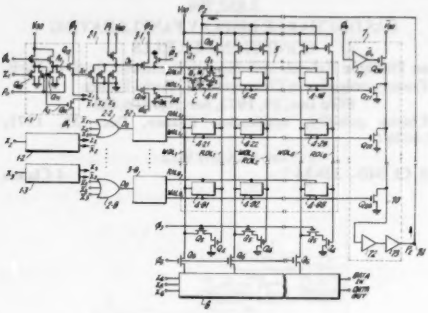
Claims priority, application Japan, Sept. 19, 1972, 47-94370

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 DR **5 Claims**

A dynamic memory circuit in which the stored information is periodically refreshed includes a circuit for precharging the write digit lines of the memory circuit when an access signal is received from an external source. The precharge circuit in-

cludes circuit means which prevent the precharge of the write digit lines in response to an access signal while any of the write



gates of the memory cells of the circuit are closed to prevent the destruction of the information stored in the memory cells.

3,832,700

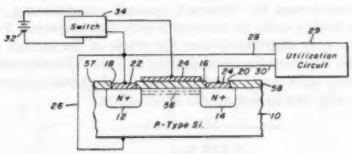
FERROELECTRIC MEMORY DEVICE

Shu-Yau Wu, and Maurice Hubert Francombe, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 24, 1973, Ser. No. 354,022

Int. Cl. G11c *11/22, 11/40*

U.S. Cl. 340—173.2 **8 Claims**



A ferroelectric memory device utilizing the remanent polarization of a thin, ferroelectric film to control the surface conductivity of a bulk semiconductor and perform the memory function. The structure of the device is similar to a conventional MIS field effect transistor with the exception that the gate insulating layer is replaced by a thin film of active ferroelectric material comprising a reversably polarizable dielectric exhibiting hysteresis.

3,832,701

TRANSFER CIRCUIT FOR SINGLE WALL DOMAINS

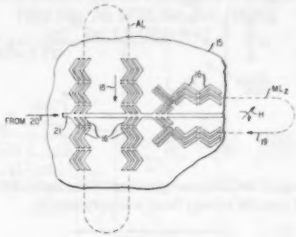
Andrew Henry Bobeck, Chatham, and Terence John Nelson, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1973, Ser. No. 345,511

Int. Cl. G11c *11/14*

U.S. Cl. 340—174 TF **4 Claims**

Transfer of a single wall domain from one channel to another is achieved by blocking the path of a domain to its next normal position to a manner to create a temporary path along which the blocked domain adjusts its shape for movement to an alternate position to an alternate channel. A pulse



on a properly disposed electrical conductor when formed with permalloy produces the desired operation.

3,832,702

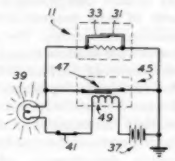
LATCHING MEANS FOR SENSING APPARATUS

Nikolaus A. Szeverenyi, Warren, Pa., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Continuation-in-part of Ser. No. 236,148, March 20, 1972. This application Sept. 12, 1973, Ser. No. 396,873

Int. Cl. G08b *21/00*

U.S. Cl. 340—244 R **8 Claims**



A latching means for providing a steady electrical signal from a sensor device to a current indicating means in a sensing apparatus. The latching means, which may be energized by heat, light, or electrical current, assures a steady signal upon the initial engagement of the heat responsive means within the sensor device.

3,832,703

APPARATUS FOR DETECTING SIGNAL TRANSMISSION

Richard W. Lenert, and Edward A. Rose, Jr., both of Annandale, Va., assignors to LTV Electrosystems, Inc., Greenville, Tex.

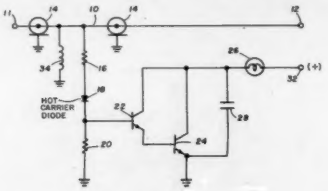
Continuation of Ser. No. 171,907, Aug. 16, 1971, abandoned. This application June 4, 1973, Ser. No. 366,517

Int. Cl. G08b *21/00*

U.S. Cl. 340—248 R **4 Claims**

A broadband coupler tied to a transmission line directs a portion of signal energy on the line to a diode signal detector. The signal detector responds to the energy directed from the transmission line through the coupler to produce a transmission signal current during the presence of a signal on the line. This transmission signal current activates a high input im-

pedance transistorized switch having an indicator lamp energized by the closing of the switch. Only during the transmission of a signal and the energization of the indicator lamp does the circuit require energy from a supply source.



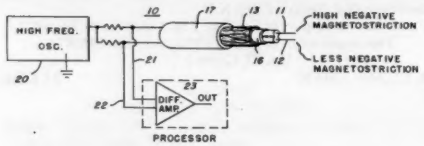
3,832,704
DUAL WIRE INTRUDER DETECTOR

Vahram S. Kardashian, Plymouth Village, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 244,540, April 17, 1972, abandoned. This application June 19, 1973, Ser. No. 371,435

Int. Cl. G08b *13/22*

U.S. Cl. 340—258 R **3 Claims**



A perimeter security system comprising a strain sensitive line sensor in the form of dual magnetostrictive thin film plated wires having uniaxial anisotropy. The plated wire line sensor is preferably buried in a shallow trench or the like and detects intrusion in the vicinity of the line as the line sensor is stressed by the intruder causing a displacement of the earth. One of the dual plated wires is made to have a different degree of magnetostrictiveness than the other. The detection system is selectively sensitive to the motion of a mass on a surface, but tends to reject magnetic disturbances which effectively produce the same signal.

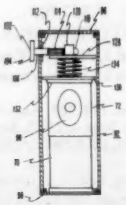
3,832,705
ALARM DEVICE

Barry B. King, 28 Gannett Rd., Victor, N.Y. 14564, and Ralph E. King, 68 F. Clintwood Ct., Rochester, N.Y. 14620

Filed June 14, 1973, Ser. No. 369,871

Int. Cl. G08b *15/00*

U.S. Cl. 340—280 **18 Claims**



A personal security device that is readily carried by hand and that includes an alarm activating unit that can be preset and restrained by a finger so that when released the activating unit automatically separates from the alarm device setting off a signal generator to produce continuous alarm signals.

3,832,706
GAS DISCHARGE DISPLAY PANELS HAVING CONDITIONING CELLS

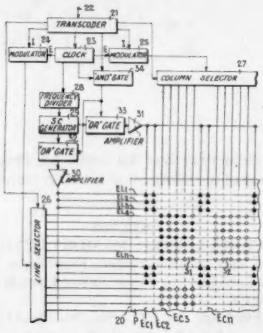
Jean Phillippe Reboul, and Jacques Portmann, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 19, 1972, Ser. No. 316,463

Claims priority, application France, Dec. 23, 1971, 71.46397

Int. Cl. G09f *9/32*

U.S. Cl. 340—324 M **4 Claims**



A display system utilising gas discharge display panels, with or without a matrix delimiting the display cells, wherein the panel is conditioned by "internal optical" conditioning, to permit the display cells to develop a very fast response. For this purpose, cells distributed over the whole of the surface of the panel are reserved for conditioning and are "illuminated" at a frequency sufficiently lower than the holding frequency of the display cells, not to disturb the observation.

3,832,707
LOW COST DIGITAL TO SYNCHRO CONVERTER

James E. Buchanan, Bowie, and Carl W. Nelson, Glen Burnie, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

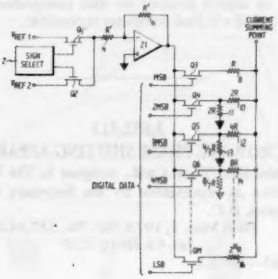
Filed Aug. 30, 1972, Ser. No. 285,393

Int. Cl. H03k *13/04*

U.S. Cl. 340—347 DA **13 Claims**

A digital to analog (D/A) converter suitable for application to digital to synchro (D/S) conversion comprises serial MOS FET (Metallic Oxide Semiconductor-Field Effect Transistor) switches and an inverting amplifier, or buffer, to compensate for variations in FET resistance in the ON state. A reference voltage of a given polarity is gated ON in one FET and inverted in polarity in an amplifier with a gain of 1.0 for input to a bank of FET switches associated with a binary resistance network, accomplishing directly the conversion of digital data to an analog equivalent output. The reference voltage thereby gated in the first FET with one polarity is subsequently gated in the second FET switches, of the bank associated with the network, and with the opposite polarity, such that a nearly constant resistance path is afforded from the reference voltage to the output of the second FET switches. Employing identical FET switches throughout the D/A converter, the non-linear properties of the FET switches are compensated regardless of reference

voltage polarity. To improve further the accuracy of D/A conversion of the invention, an input resistance is selected for the inverting amplifier equal in value to the resistance of the most significant bit resistor. Compensating resistors af-



fording resistance equalization are provided for at least a few of the next, most significant bit positions resulting in highly accurate digital to analog and digital to synchro conversion using low cost MOS FET switches with high ON resistance.

3,832,708

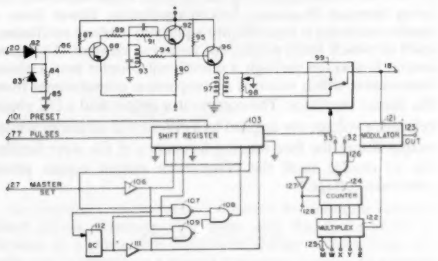
LORAN SIGNAL SYNTHESIZER

Robert M. Eisenberg, Derwood, Md., assignor to The Singer Company, New York, N.Y.

Division of Ser. No. 176,802, Sept. 1, 1971. This application Feb. 7, 1973, Ser. No. 330,217

Int. Cl. G08c *13/00*

U.S. Cl. 340—352 **2 Claims**



This specification describes a Loran simulator for simulating both type A and type C Loran signals. A pulse generator for generating Loran C pulse trains is driven from a counter. The counter has timing pulses supplied to it from a clock. The output of the counter, when a prescribed count is reached, triggers the generation of the Loran C pulses. In addition, the Loran A pulse generator is triggered by an output of the Loran C generator. Separate output terminals are provided for each type of Loran pulse trains. A control device supplies the counter at the beginning of each cycle with a number whose value determines the time interval until the generation of the next pulse train. The control device may be manually operable or automatically operated. Radio frequency phasing effects are also generated.

3,832,709

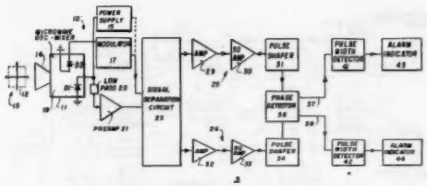
MOTION DETECTION APPARATUS HAVING THE ABILITY TO DETERMINE THE DIRECTION OF MOTION AND RANGE OF A MOVING OBJECT

Carl F. Klein, and James R. Bailey, both of Milwaukee, Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Dec. 26, 1972, Ser. No. 318,001

Int. Cl. G01s *9/42*

U.S. Cl. 343—5 PD **35 Claims**



A motion dectection system operable to detect the range and direction of motion of a moving object includes Doppler radar apparatus having single oscillator-mixer circuit operable as a transmitter to generate microwave signals alternately at first and second frequencies for radiation into an area being monitored such that whenever the transmitted signals at the two frequencies are reflected off a moving object, two distinct Doppler signals are produced, and as a receiver to detect the reflected Doppler signals; one of the Doppler signals phase leads or phase lags the other Doppler signal as a function of the direction of movement of the object with the magnitude of the phase difference indicating the range of the object, and the Doppler radar apparatus includes circuitry for processing the Doppler signals to determine the phase relationship between the received Doppler signals.

3,832,710

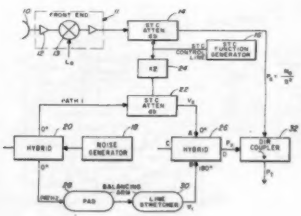
NOISE INJECTION IMPLEMENTATION FOR CONSTANT FALSE ALARM RATE RADAR

Anthony D. Petrilla, Madison, Wis., and Edwin B. Smith, Medford Lakes, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 4, 1973, Ser. No. 347,951

Int. Cl. G01s *7/34*

U.S. Cl. 343—5 SM **8 Claims**

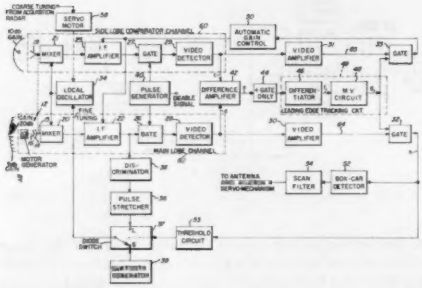


A noise-injection system for use in a radar receiver which employs STC. Noise is injected into the receiver channel to maintain the noise level in the receiver constant as a function of range. This results in a constant signal-to-noise ratio and a constant probability of detecting a minimum-size target. The noise-injection system is controlled by the STC function generator.

3,832,711
GUIDANCE SYSTEM

George H. Grant, Sudbury, and Joseph D. Hadad, Methuen, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 13, 1964, Ser. No. 360,174
Int. Cl. G01s 9/00, 9/02
U.S. Cl. 343—6 DF 17 Claims



17. A source locating system comprising:

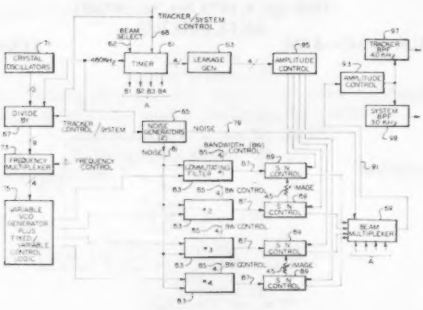
a receiver means responsive to harmonics of radiating source signals for providing an error signal proportional to the location of said source with respect to said receiver means;

and an acquisition radar receiver means for selecting a radiating source and providing source discrimination signals to said receiver means.

3,832,712
DOPPLER SIGNAL SIMULATOR

Philip J. Goetz, Pleasantville, N.Y., and Kaya Erk, Ankara, Turkey, assignors to The Singer Company, Little Falls, N.J.

Filed Feb. 15, 1973, Ser. No. 332,742
Int. Cl. G01s 7/40
U.S. Cl. 343—17.7 33 Claims

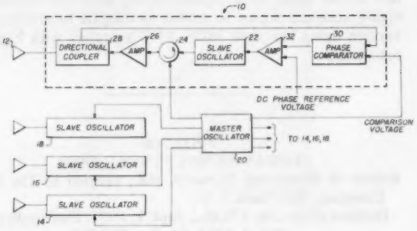


A doppler signal simulator in which a composite doppler spectra including background noise, signal, leakage signal, and image beam signals simulating, in proper sequence, each of the four beams of a doppler navigation system is shown. White noise is generated digitally to provide background noise, and to obtain the doppler return spectra by filtering with digital commutating filters controlled by a plurality of center frequencies generated by logic circuits. Leakage and image signals are generated and added to the doppler spectra and noise to provide the four composite signals which are then multiplexed and filtered to provide the final output. Gain control is provided for the various signals to simulate various flight conditions. Selection logic allows selecting a signal to test the post IF and tracker or tracker alone. All controls are adaptable to digital control so that comprehensive testing under control of a digital computer is possible.

3,832,713
MICROWAVE PHASE SHIFTING APPARATUS

David Rubin, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1973, Ser. No. 337,045
Int. Cl. H01q 3/26
U.S. Cl. 343—100 SA 4 Claims



Apparatus for phase shifting between radiating elements of an antenna array by utilizing the inherent phase difference existing between frequency locked oscillators. Power from a master oscillator is injected into a plurality of slave oscillators, each of which feeds a different radiating element. The slave output is also fed through a directional coupler into a phase comparator which receives a comparison output signal from the master oscillator. The comparator output and a DC phase reference voltage are applied to a differential amplifier whose output forces the free-running frequency of the slave oscillator to change until the comparator output equals phase reference voltage.

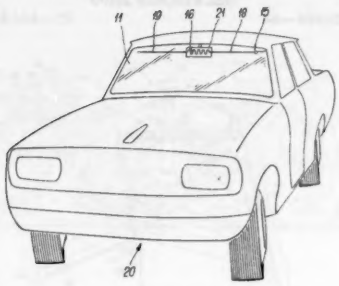
3,832,714
WINDSHIELD ANTENNA

Frederick Antony Cleminson, London, and Brian Arthur Ariss, Birmingham, both of England, assignors to Triplex Safety Glass Company Limited, London, England

Filed Nov. 13, 1973, Ser. No. 415,487
Claims priority, application Great Britain, Nov. 14, 1972, 52577/72
Int. Cl. H01q 1/32
U.S. Cl. 343—713 15 Claims

A vehicle windscreen is provided with electrical antenna conductors in the form of a row of open loops connected to at least one straight horizontal arm. The loops lie in an area corresponding to the rear view mirror position. In situ in a vehicle the loops do not project below the lower edge of the rear view mirror and the loop do not project beyond the lateral edge of

the mirror. Between three and 12 loops may be provided and they may be connected to a second horizontal conductor arm.



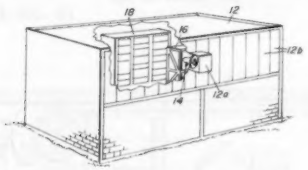
A vertical conducting arm may also be connected to the row of loops. The conductors may lie on the inner surface of the windscreen.

3,832,715

WIDE ANGLE SCANNING AND MULTIBEAM SINGLE REFLECTOR

Mostafa S. Afifi, Rockville, and Allan Jacobs, Potomac, both of Md., assignors to Page Communications Engineers, Inc., Washington, D.C.

Filed Sept. 23, 1971, Ser. No. 183,026
Int. Cl. H01q *3/12*
U.S. Cl. 343—761 **10 Claims**



An antenna reflector system wherein the reflector remains fixed during scanning operations and the feed, which is located in a protective equipment shelter remote from the reflector, is moved on a special trajectory in order to provide the required scanning with minimal degradation in gain. A feed positioner provides the requisite movement of the feed along *x*-, *y*- and *z*- axes. The reflector is preferably in the form of a shallow, offset parabola.

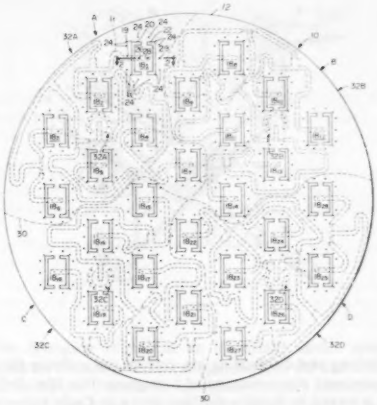
3,832,716

RADIO FREQUENCY SLOT ANTENNA

Troy E. Plunk, Bedford, and Richard J. Laramee, Dedham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 23, 1973, Ser. No. 363,238
Int. Cl. H01q *13/10*
U.S. Cl. 343—770 **11 Claims**

A stripline slotted array antenna is disclosed wherein the radiating efficiency and bandwidth are improved by including in each radiating element a pair of adjacent radiating slots. The antenna includes center conductor circuitry separated from a pair of ground plane elements, one of which is the radiating face of the antenna and one of which is the back plate of the antenna. The pair of slots is formed in the radiating face of the antenna. The pair of radiating slots is disposed adjacent to an end portion of the center conductor circuitry, one being coupled to an electric field existing between the end



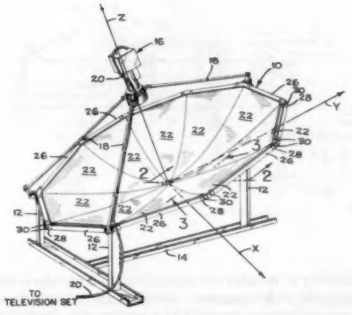
of such circuitry and the back plate and the other one of such pair of radiating slots being coupled to an electric field existing between the center conductor circuitry and the radiating face of the antenna.

3,832,717

DISH REFLECTOR FOR A HIGH GAIN ANTENNA

Robert B. Taggart, Jr., 575 So. Rengstarff Ave., Apt. 95, Mountain View, Calif. 94040

Filed Mar. 3, 1972, Ser. No. 231,673
Int. Cl. H01q *15/20*
U.S. Cl. 343—840 **6 Claims**



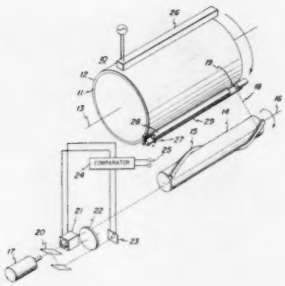
A dish reflector for a high antenna formed by a plurality of generally triangular petals joined edgewise to form a quasi-paraboloid configuration.

3,832,718

NON-IMPACT, CURIE POINT PRINTER

Ami E. Berkowitz, Schenectady, and William H. Meiklejohn, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 19, 1973, Ser. No. 325,064
Int. Cl. G01d 15/12; G02b 17/00; H01v 3/04
U.S. Cl. 346—74 MT 13 Claims



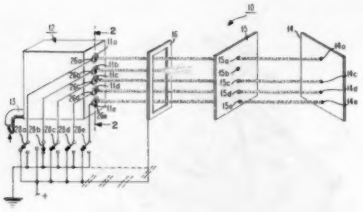
Printing and duplicating are carried out utilizing the thermoremanent magnetization of a magnetic thin film. Information is stored by heating the film above its Curie temperature and allowing it to cool in a small magnetic field. A copy of the latent image is made by coating the magnetized areas of the film with a magnetic ink and transferring the ink to paper. The film is locally heated by selective heating with a light source, preferably a laser.

3,832,719

MODIFIED DIFFUSED INK JET PRINTER

Johann H. Meier, and Walter T. Pimbley, both of Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 21, 1972, Ser. No. 246,192
Int. Cl. G01d 15/18
U.S. Cl. 346—75 1 Claim



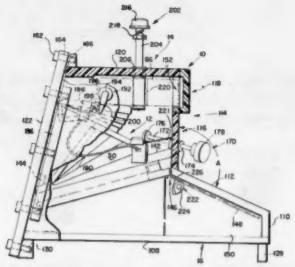
A plurality of nozzles are connected to a common manifold supplying ink under pressure. Individual nozzle electrodes are either grounded or connected to a source of potential. A common loop electrode between the nozzles and a document is connected to a source of potential. Streams from grounded nozzles are dispersed into a mist which is blocked by a shield having orifices aligned with the nozzles so as to provide selective printing for a matrix type printer.

3,832,720

UNDERWATER CAMERA HOUSING WITH MEANS FOR MANIPULATING A FLASH UNIT

Russell P. Cook, Key Biscayne, Fla., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 9, 1973, Ser. No. 377,604
Int. Cl. G03b 17/08
U.S. Cl. 354—64 15 Claims



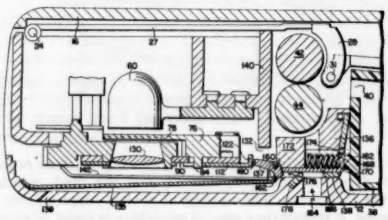
An underwater housing for receiving a camera which is adapted to utilize a multi-lamp flash unit. The housing includes a control device for manipulating the flash unit from a position exteriorly of the underwater housing.

3,832,721

LOCKOUT MECHANISM FOR AUTOMATIC TRIM ASSEMBLY RETURN MECHANISM

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 3, 1973, Ser. No. 420,914
Int. Cl. G03b 19/04, 19/18
U.S. Cl. 354—21 27 Claims



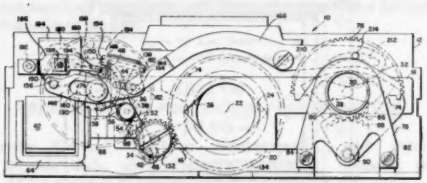
A lockout mechanism for an automatic normal return mechanism for a manually adjustable trim assembly is provided. In a preferred embodiment, the lockout mechanism is employed in conjunction with a foldable camera having an automatic exposure control system. The camera includes a number of housing members interconnected for movement between erected and folded configurations. The automatic normal return mechanism is disposed within one of the housing members and operates in response to return of the camera to its folded configuration. The lockout mechanism precludes the return of the trim assembly to its normal position when the film being used within the camera requires a given trim setting to correct for specific exposure parameters due to film speed variations.

3,832,722

APPARATUS AND SYSTEM FOR FLASH PHOTOGRAPHY

Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 168,671, Sept. 3, 1971, abandoned.
This application Mar. 15, 1973, Ser. No. 341,730
Int. Cl. G03b 7/16
U.S. Cl. 354—29 57 Claims



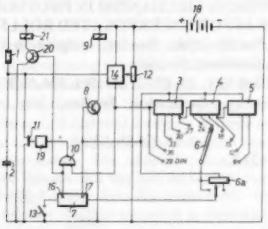
An exposure control mechanism featuring a follow-focus mechanism. This mechanism includes a face-groove cam mounted upon a focus adjusting wheel along with a cam follower mounted upon a focus adjusting wheel along with a cam follower mounted co-pivotally therewith. By adjusting the radial orientation of the cam follower, the follow-focus mechanism may be selectively trimmed.

3,832,723

EXPOSURE CONTROL DEVICE FOR PHOTOGRAPHIC CAMERAS

Werner Nickel, Sinn, Germany, assignor to Ernst Leitz GmbH, Westzlar, Germany

Filed Apr. 19, 1973, Ser. No. 352,652
Claims priority, application Germany, Apr. 21, 1972, 2219523
Int. Cl. G03b 7/08
U.S. Cl. 354—51 3 Claims



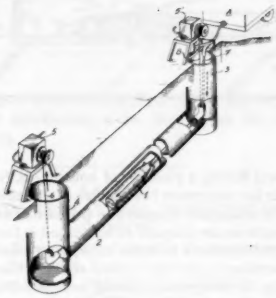
A photographic camera having a shutter, a shutter opening mechanism, a shutter closing mechanism, an exposure control device depending on the charged state of an RC circuit with a photoconductor cell therein exposed during film exposure, and wherein a threshold limit switch is connected after the RC circuit, a first electromagnet is inserted in the output circuit of the limit switch, and this magnet actuates the shutter closing mechanism. The exposure control device is improved by having therein means for digital counting connected between the limit switch and the first electromagnet for selecting film sensitivity, the outputs of the counting means being selectively connectible with circuit elements which vary the current supply to the first electromagnet and simultaneously short circuit the charging capacitor of the RC circuit.

3,832,724

VIDEO PHOTO RECORDING DEVICE FOR THE INSPECTION OF THE INTERIOR OF PIPES

Mark Duval, St-Bruno De Montarville, Quebec, Canada, assignor to Sanitank Inc., Montreal, Canada

Filed May 18, 1973, Ser. No. 361,659
Int. Cl. G03b 17/08
U.S. Cl. 354—63 6 Claims



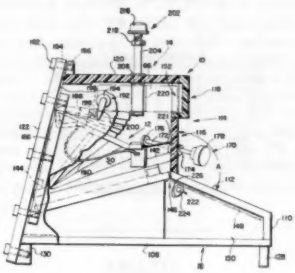
This invention relates to an inspecting device specially adapted for detecting and locating defects or the like in the interior of a pipe. The device comprises a video camera and a film camera enclosed in a watertight housing which also carries lamps at the front end thereof for adequately illuminating the interior of the pipe. The device is pulled through the pipe by winches and as inspection progresses the interior thereof is continuously observed at a remote location on a TV monitor associated with the video camera and each time a defect or the like is noted a picture is taken by the film camera.

3,832,725

UNDERWATER HOUSING FOR ENCLOSING PHOTOGRAPHIC APPARATUS

Russell P. Cook, Key Biscayne, Fla., assignor to Polaroid Corporation, Cambridge, Mass.

Filed July 9, 1973, Ser. No. 377,605
Int. Cl. G03b 17/08
U.S. Cl. 354—64 30 Claims



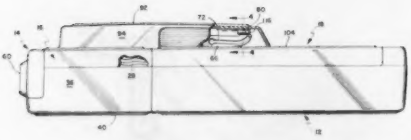
An underwater housing for use with a "self-developing" camera of the type including a mechanism for advancing a film unit from a position within the camera, through an exit opening, and along a film path of travel outside of the camera. The housing encloses both the camera and the external film path of travel and features a transparent port through which the film unit may be observed.

3,832,726

COLLAPSIBLE CAMERA

Patrick L. Finelli, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 23, 1973, Ser. No. 353,901
Int. Cl. G03b 17/04
U.S. Cl. 354—187 6 Claims



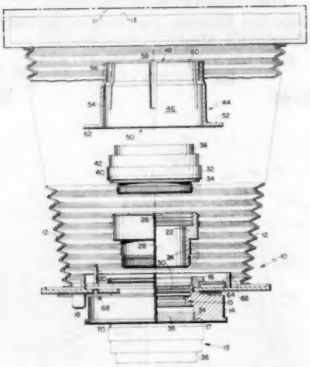
A camera having a plurality of housing sections coupled to each other for movement between an extended operative position and a collapsed inoperative position. First and second housing sections are adapted to be located in face-to-face relation when the camera is in the collapsed position and a third housing section is provided with a resilient member which is adapted to be compressed during movement of the camera housing sections into the collapsed position to provide a resilient force for urging the second housing section into face-to-face relation with the first housing section.

3,832,727

PHOTOGRAPHIC CAMERA HAVING AN INTERNALLY MOUNTED OBJECTIVE LENS

Myron A. Seiden, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 16, 1973, Ser. No. 389,008
Int. Cl. G03b 3/00
U.S. Cl. 354—196 10 Claims



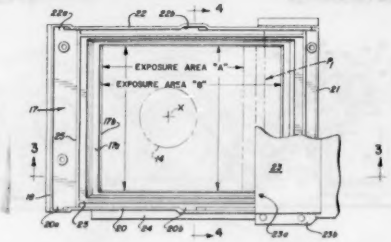
A photographic camera characterized in having its objective lens mounted behind the camera shutter and within the collapsible bellows interfaced between the shutter and the camera's film plane. The camera aperture, located within the lens housing, is fully adjustable due to an actuating mechanism placed between the lens housing and an adjustment indicator located outside the bellows. Configured as such, the camera provides an optimized design for extreme image reduction of a full baseboard view upon a relatively small film format.

3,832,728

CAMERA ACCOMMODATING TWO SIZES OF FILM

Edwin E. Faris, Wyckoff, and Charles J. Hertling, Bloomfield, both of N.J., assignors to Berkey Photo, Inc., Paramus, N.J.

Filed July 3, 1972, Ser. No. 268,573
Int. Cl. G03b 19/02
U.S. Cl. 354—210 5 Claims



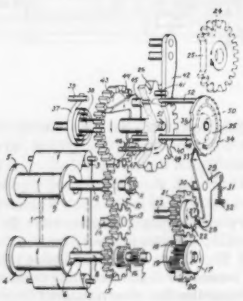
A camera is provided which is adapted to accommodate rectangular film packets or cartridges of two different sizes. The end wall dimension of each packet is substantially the same and the smaller packet is provided with unique exterior protuberances formed along the elongated sides thereof. The camera includes an opaque housing with a lens mounted on the front end thereof, and a film packet holder affixed to the interior of the housing and spaced rearwardly of the lens. The holder comprises a frame which delimits a rectangular area, the latter being in registered relation with the optical axis of the lens. The delimited rectangular area is adapted to accommodate either size packet. The sides of the frame, defining the elongated sides of the area, have formed therein recesses which are adapted to receive the exterior protuberances of the smaller size packet when the latter is accommodated in the holder. The relative location of the recesses on the frame insures proper positioning of the small size packet with respect to the optical axis of the lens. The spacing between the narrow sides of the rectangular area is such that the larger size packet will snugly fit therebetween.

3,832,729

IMAGE DIVIDING MECHANISM IN PHOTOGRAPHIC CAMERAS FOR UNPERFORATED ROLLFILM

Lave Tenne, Norrbyvallda, Sweden, assignor to Fritz Victor Hasselblad, Goteborg, Sweden

Filed Nov. 15, 1972, Ser. No. 306,660
Claims priority, application Sweden, Nov. 26, 1971, 15141/71
Int. Cl. G03b 17/28
U.S. Cl. 354—213 5 Claims



Apparatus for controlling the advance of unperforated rollfilm in a camera from a supply spool to a take-up spool. Film

advancing means is provided to rotate the take-up spool by an amount which at least equals the maximum rotation of the spool required to advance the film according to the preselected spacing between successive exposures on the film. A differential responds to rotation of both the supply and the take-up reels and provides an output which indicates the extent of rotation of both the spools. The differential provides a distinctive output when the output of the differential attains a predetermined magnitude, and this output terminates further advancing of the film.

3,832,730

APPARATUS FOR PROCESSING PHOTOGRAPHIC FILMS

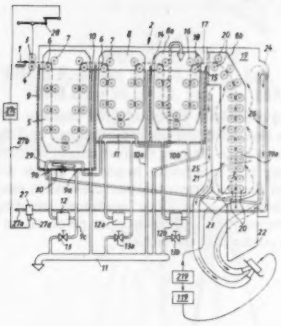
Erwin Geyken; Gerhard Schwarzmaier, and Peter Dawidowitsch, all of Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 4, 1973, Ser. No. 393,834

Claims priority, application Germany, Sept. 2, 1972, 2243276

Int. Cl. G03d *3/00*

U.S. Cl. 354—299 **13 Claims**



A processing apparatus wherein a dryer follows a first vessel for a supply of developing solution, a second vessel for a fixing bath and a third vessel for a rinse bath. The duct for evacuation of spent gaseous fluid from the dryer contains a heat exchanger whose coil conveys a stream of fresh water which is heated in the coil prior to entering additional heat exchangers in the first two vessels. The additional heat exchangers heat the respective liquids and the last additional heat exchanger discharges heated water into the rinse bath. The vessel for developing solution further contains a thermostatically controlled heating unit. The heat exchanger in the dryer receives unheated water from a supply pipe through a valve which is opened in automatic response to admission of films into the first vessel and remains open as long as at least one film travels between the inlet of the first vessel and a receptacle which receives films from the dryer.

3,832,731

PHOTOGRAPHIC FILM ASSEMBLAGE

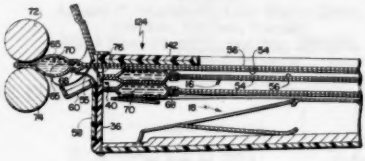
Gordon F. Kinsman, Billerica, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 26, 1973, Ser. No. 354,735

Int. Cl. G03b *19/10*

U.S. Cl. 354—304 **31 Claims**

A photographic film assemblage including a container, at least one "self-developing" film unit within the container which is adapted to be exposed and then treated with a fluid processing composition, and structure associated with the



container, so as to form an integral part of the assemblage, for controlling the distribution of the fluid within the film unit during treatment.

3,832,732

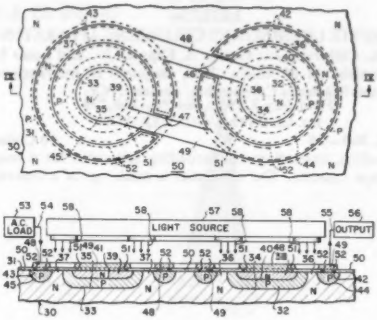
LIGHT-ACTIVATED LATERAL THYRISTOR AND AC SWITCH

John S. Roberts, Export, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 11, 1973, Ser. No. 322,831

Int. Cl. H01l *15/00*

U.S. Cl. 357—19 **9 Claims**



A light-activated thyristor or ac switch is provided in a semiconductor body with the emitter and base regions adjoining the same major surface. The central PN junction between the base regions has shallow impurity concentration gradients less than about 1×10^{22} per cm^4 and preferably less than about 1×10^{20} per cm^4. Preferably the base regions have surface impurity concentrations between about 2×10^{15} and 1×10^{18} per cm^3 and surface widths substantially equalizing the gains of the equivalent transistors of the structure. The PN junctions may be interwoven, substantially linear, and/or offset to provide a higher power, and/or more uniform current distribution in the device.

3,832,733

MANUAL INPUT RECORDATION OF DATA AND COMPLEMENT

Brice Eldridge, New York, N.Y., assignor to Telewave Systems, Inc., New York, N.Y.

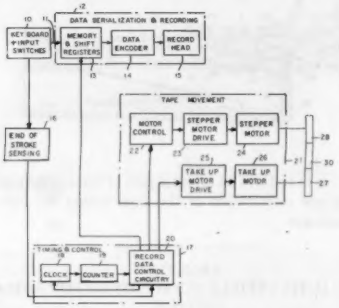
Continuation of Ser. No. 236,262, March 20, 1972, abandoned. This application Sept. 12, 1973, Ser. No. 396,476

Int. Cl. G11b *5/02*

U.S. Cl. 360—4 **19 Claims**

A recording mechanism and method for providing data and data signals representative of the depression or non-depres-

sion of a plurality of keys of a keyboard of a shorthand machine, said mechanism including means for detecting and storing in parallel information representing the depression or non-depression of said keys, means for sensing the completion



of a stroke of said keys and means responsive to the sensing of the end of the stroke to serially shift out the stored parallel information to generate and record data and data signals on a movable recording media.

3,832,734

CASSETTE LOADING AND UNLOADING APPARATUS

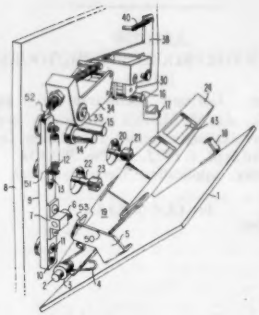
Lloyd K. Childress, Jr.; George B. Flippen, Jr., and Louis M. McDaniels, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 3, 1972, Ser. No. 268,239

Int. Cl. G11b *5/00, 15/32, 23/04*

U.S. Cl. 360—96 **10 Claims**

A loading, unloading and recording apparatus for a magnetic tape cassette. The apparatus is made up of a cassette hopper which is pivotable for properly positioning a cassette in communicating relationship with a retractable read/write head and pinch roller mechanism. Pivotable on the same axis is a loading door which is spring biased away from the hopper. Partial closing of the door will result in the proper positioning of the cassette, while complete closing and latching of the door will actuate the retractable mechanism for inserting a



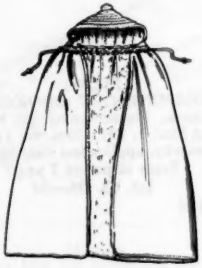
read/write head and pinch roller into the cassette. When the cassette is to be unloaded, the door is unlatched and the spring causes the door to open. During the first extent of travel of the door in opening the read/write head and pinch roller are withdrawn from the cassette while the cassette is maintained in position. Thereafter, the door continues pivoting to its completely open position and the hopper pivots to an unloading position for removal of the cassette.

DESIGNS

AUGUST 27, 1974

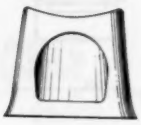
232,496
THIGH PAD
John H. Rawlings, Ava, Mo., assignor to Questor Corporation, Toledo, Ohio
Filed Dec. 6, 1971, Ser. No. 205,455
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27

232,497
HOODED CAPE
Eileen F. Busse, R.R. 4, Knox, Ind. 46534
Filed June 19, 1972, Ser. No. 263,845
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—179



232,498
SCARF
Frank P. Cianciolo, 138 Whitfield St., Guilford, Conn. 06437
Filed Aug. 14, 1972, Ser. No. 280,147
Term of patent 7 years
Int. Cl. D2—*03*
U.S. Cl. D2—358

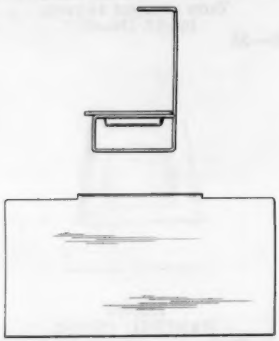
232,499
STOOL
Arnold C. Martinelli, Lake Shore Drive, Rawdon, Quebec, Canada
Filed Nov. 27, 1972, Ser. No. 309,652
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—33



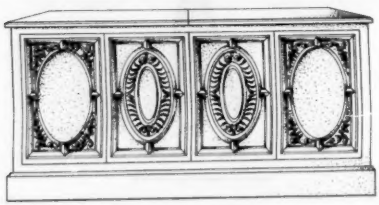
232,500
HANGING CHAIR
Helen N. McGreevy and Joe E. Cotta, both of 77 Estabrook St., San Leandro, Calif. 94577
Filed Feb. 12, 1973, Ser. No. 331,668
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

232,501
CHAIR
Giuseppe Longato, Via Makalle, 19, Padova, Italy
Filed May 26, 1972, Ser. No. 257,477
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—66

232,502
UTILITY STAND
Joseph P. Richterich, Carouge, Switzerland, assignor to Prodonta S.A., Geneva, Switzerland
Filed Sept. 25, 1972, Ser. No. 291,577
Claims priority, application Switzerland May 24, 1972
Term of patent 14 years
Int. Cl. D6—*06*; D24—*99*
U.S. Cl. D6—130

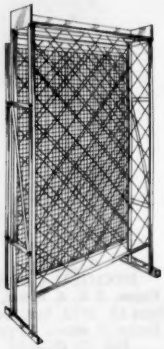


232,503
CABINET
Robert Levine, Roslyn, N.Y., assignor to Capehart Corporation, New York, N.Y.
Filed July 18, 1972, Ser. No. 272,982
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—154

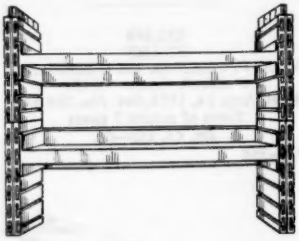


232,504
TABLE
Harry Bartley Archinal, Chester Springs, Pa. 19425
Filed Dec. 27, 1972, Ser. No. 319,028
Term of patent 7 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

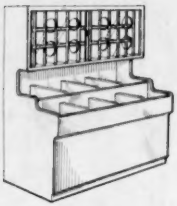
232,505
WINE STORAGE RACK
Harrison R. Steeves, Jr., Birmingham, Ala., assignor to The Rack Specialty Company
Filed Sept. 5, 1972, Ser. No. 286,460
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—188



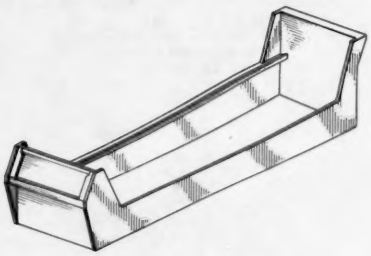
232,506
COMPONENTAL BOOKCASE
Sergio Mazza, Piazza Firenze 15, Milan, Italy
Filed Mar. 1, 1971, Ser. No. 119,984
Claims priority, application Italy Sept. 4, 1970
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—184



232,507
COMBINED PHONOGRAPH RECORD AND TAPE CARTRIDGE STORAGE RACK
Joel A. Cheek, Charlotte, N.C., assignor to Universal Enterprises, Inc., Charlotte, N.C.
Filed Aug. 21, 1972, Ser. No. 282,485
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—189

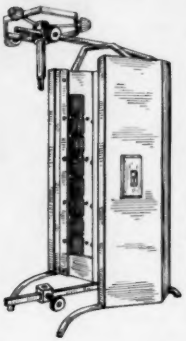


232,508
CARD DRAWER
David M. Wright, Shrewsbury, Mass., assignor to Barry Wright Corporation, Watertown, Mass.
Filed Oct. 5, 1972, Ser. No. 295,197
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—199

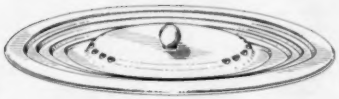


232,509
PILLOWCASE OR SIMILAR ARTICLE OF BED LINEN
Nancy Ann Scherer, Plainfield, N.J., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed Nov. 2, 1972, Ser. No. 303,120
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—264

232,510
VERTICAL COOKING DEVICE
Chris Liakouras and William Liakouras, both of 314 S. Halsted St., Chicago, Ill. 60606
Filed June 19, 1972, Ser. No. 264,143
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110

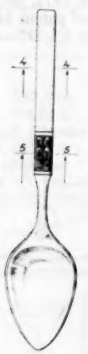


232,511
COVER FOR COOKING PANS OR THE LIKE
Milton L. Heiser, Wayzata, and David Eriksen, Minneapolis, Minn., assignors to Fingerhut Corporation, Minnetanka, Minn.
Filed Nov. 15, 1972, Ser. No. 306,934
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—131



232,512
SPOON OR SIMILAR ARTICLE
Melvin A. Lea, Skenendoah Drive, R.D., Oneida, N.Y. 13421
Filed Jan. 15, 1973, Ser. No. 323,845
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

232,513
SPOON OR SIMILAR ARTICLE
Melvin A. Lea, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jan. 15, 1973, Ser. No. 323,860
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



232,514
WALL MOUNTABLE OUTLET RECEPTACLE FOR A VACUUM CLEANING SYSTEM
Jacob C. Mol, Grand Rapids, Mich., assignor to Wal Vac, Inc., Grand Rapids, Mich.
Filed Jan. 17, 1972, Ser. No. 218,650
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D7—165

232,515
HOE BLADE
George L. Steck, Dayton, and Mark A. Steck, Miamisburg, Ohio, assignors to Steck Manufacturing Company, Inc., Dayton, Ohio
Filed June 14, 1972, Ser. No. 262,716
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—11

232,516
POWER-DRIVEN KNIFE SHARPENER
Brian Scott Smith, High Wycombe, England, assignor to Tower Housewares Limited, Wombourne, Wolverhampton, Staffordshire, England
Filed Nov. 15, 1972, Ser. No. 306,810
Claims priority, application Great Britain Aug. 25, 1972
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—63

232,517
PULL
David P. Zagaroli, Hickory, N.C., assignor to Ajax Hardware Corporation, City of Industry, Calif.
Filed Mar. 14, 1973, Ser. No. 341,107
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—166

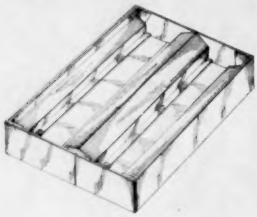
232,518
HOOK ATTACHMENT FOR LADDERS
John J. McCoy, 1606 Wakefield Ave., Youngstown, Ohio 44514
Filed Oct. 31, 1973, Ser. No. 411,346
Term of patent 3½ years
Int. Cl. D8—*08*
U.S. Cl. D8—246

232,519
RIVET
Satoru Saisho, Yokohama, Japan, assignor to Koyo Fastener and Co., Ltd., Tokyo, Japan
Filed Oct. 4, 1971, Ser. No. 186,572
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—271

232,520
BOTTLE
Alan B. Canfield, South Holland, Ill., assignor to A. J. Canfield, Co., Chicago, Ill.
Filed Aug. 25, 1972, Ser. No. 283,798
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—96

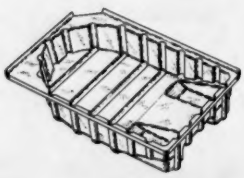
232,521
COMBINED BOTTLE AND CLOSURE THEREFOR
David Edward Roche, Nashua, N.H., assignor to Family Products Incorporated, Tyngsboro, Mass.
Filed Sept. 27, 1972, Ser. No. 292,776
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168

232,522
CARRYING TRAY FOR BEVERAGE CARTONS AND THE LIKE
Ulf F. I. Hakansson, Fridafors, Sweden, assignor to Skogsagarnas Industrie AB, Vaxjo, Sweden
Filed Sept. 2, 1971, Ser. No. 177,534
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177

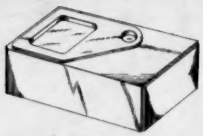


232,523
PILL BOX
Arthur A. Nudell, 3821 Sugar Loaf Lane, Skokie, Ill. 60076
Filed June 7, 1972, Ser. No. 260,710
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—183

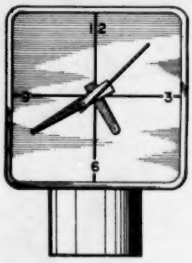
232,524
PACKAGING CONTAINER FOR COMESTIBLES OR THE LIKE
Frank R. Schy, 1659 Borden St., San Mateo, Calif. 94403
Filed June 5, 1972, Ser. No. 260,041
Term of patent 14 years
Int. Cl. D9— *03*
U.S. Cl. D9—219



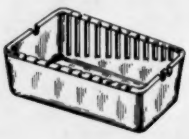
232,525
COMBINED PACKAGING AND DISPLAY CONTAINER
Jack E. Caveney, Chicago, Ill., assignor to Panduit Corp., Tinley Park, Ill.
Filed Sept. 7, 1972, Ser. No. 287,172
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



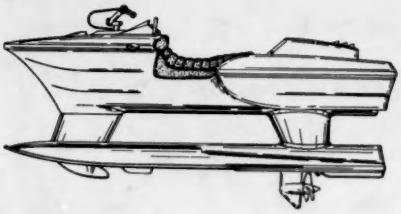
232,526
CLOCK OR SIMILAR ARTICLE
Mark Wallach, 220 E. 63rd St., New York, N.Y. 10021
Filed Feb. 8, 1972, Ser. No. 224,646
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—26



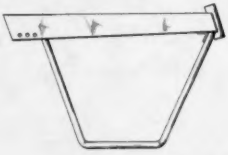
232,527
MEASURING CONTAINER
Harrison W. Sears, Deerfield, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed June 14, 1972, Ser. No. 262,864
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



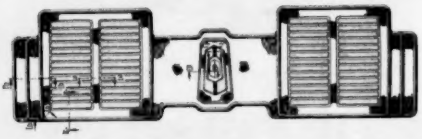
232,528
HYDROFOIL VEHICLE
William R. Stanberry, Sr., and William R. Stanberry, Jr., both of 1034 N. Kokomo, Derby, Kans. 67037
Filed Dec. 11, 1972, Ser. No. 314,269
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—69



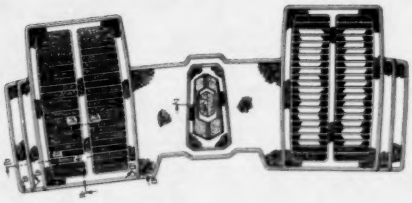
232,529
FRAME FOR MINI-BIKES AND THE LIKE
Joseph E. Shannon, 117 Parkview Drive, Whiteland, Ind. 46184
Filed July 12, 1972, Ser. No. 270,941
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111



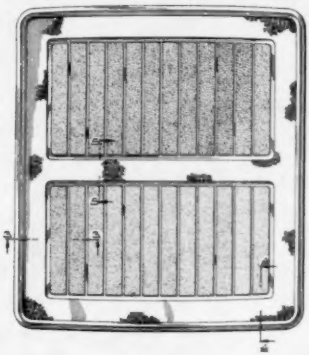
232,530
AUTOMOBILE FLOOR MAT
Charles A. Wells, Coshocton, Ohio, assignor to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 10, 1972, Ser. No. 305,311
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D12—203



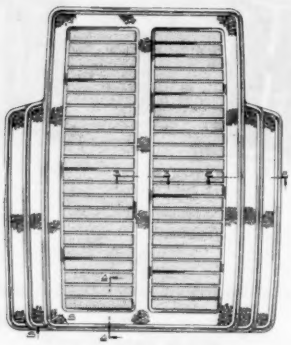
232,531
AUTOMOBILE FLOOR MAT
Charles A. Wells, Coshocton, Ohio, assignor to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 10, 1972, Ser. No. 305,312
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D12—203



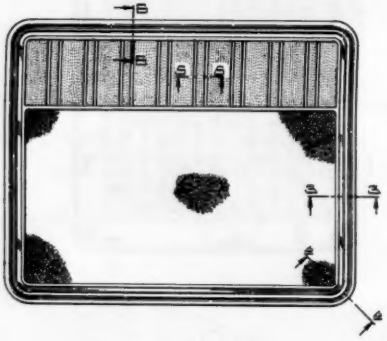
232,532
AUTOMOBILE FLOOR MAT
Charles A. Wells, Coshocton, Ohio, assignor to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 10, 1972, Ser. No. 305,313
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D12—203



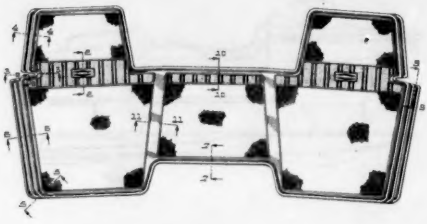
232,533
AUTOMOBILE FLOOR MAT
Charles A. Wells, Coshocton, Ohio, assignor to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 10, 1972, Ser. No. 305,314
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D12—203



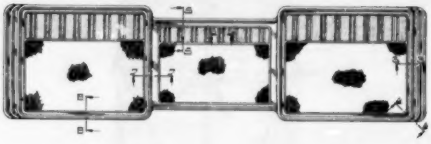
232,534
AUTOMOBILE FLOOR MAT
Raymond A. Krusinski and Charles A. Wells, Coshocton, Ohio, assignors to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 15, 1972, Ser. No. 306,567
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D12—203



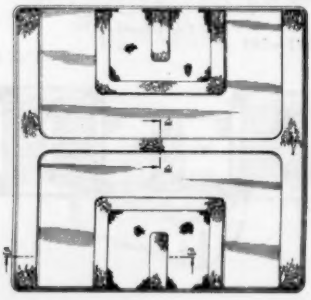
232,535
AUTOMOBILE FLOOR MAT
Raymond A. Krusinski and Charles A. Wells, Coshocton, Ohio, assignors to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 15, 1972, Ser. No. 306,624
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D12—203



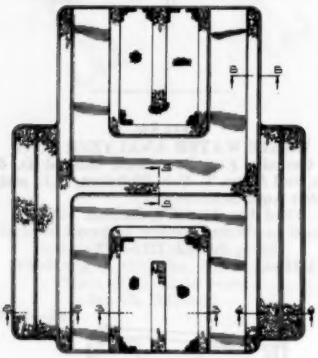
232,536
AUTOMOBILE FLOOR MAT
Raymond A. Krusinski and Charles A. Wells, Coshocton, Ohio, assignors to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 15, 1972, Ser. No. 306,625
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D12—203



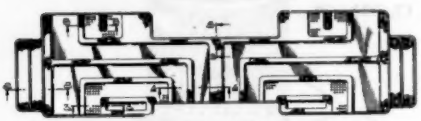
232,537
AUTOMOBILE FLOOR MAT
Raymond A. Krusinski and Charles A. Wells, Coshocton, Ohio, and Robert A. O'Neil, Wheaton, Ill., assignors to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 15, 1972, Ser. No. 306,800
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D12—203



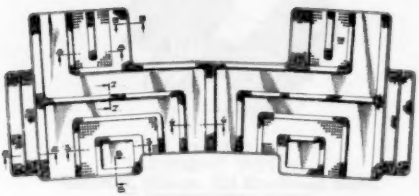
232,538
AUTOMOBILE FLOOR MAT
Raymond A. Krusinski and Charles A. Wells, Coshocton, Ohio, and Robert A. O'Neil, Wheaton, Ill., assignors to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 15, 1972, Ser. No. 306,801
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D12—203



232,539
AUTOMOBILE FLOOR MAT
Raymond A. Krusinski and Charles A. Wells, Choshocton, Ohio, and Robert A. O'Neil, Wheaton, Ill., assignors to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 15, 1972, Ser. No. 306,802
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D12—203



232,540
AUTOMOBILE FLOOR MAT
Raymond A. Krusinski and Charles A. Wells, Coshocton, Ohio, and Robert A. O'Neil, Wheaton, Ill., assignors to Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 15, 1972, Ser. No. 306,803
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D12—203

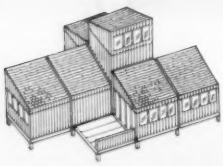


232,541
PUBLIC TELEPHONE SUPPORT
Keith David Bartley, 6250 Brokenhurst Road 46220; and Fred Arlington Dewhirst, 5313 E. Winston Drive 46226, both of Indianapolis, Ind.; Donald Michael Genaro, 501 Constant Ave., Haworth, N.J. 07641; and John Niel McGarvey, 731 Cornell Ave., Drexel Hill, Pa. 19026
Filed June 5, 1972, Ser. No. 260,064
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 L

232,542
PREASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, 280 Vanderbilt Ave., New York, N.Y. 11205
Filed July 14, 1972, Ser. No. 272,027
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A

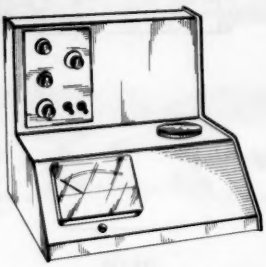
232,543
PREASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, 280 Vanderbilt Ave., New York, N.Y. 11205
Filed July 14, 1972, Ser. No. 272,028
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A

232,544
PREASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, 280 Vanderbilt Ave., New York, N.Y. 11205
Filed July 14, 1972, Ser. No. 272,029
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A

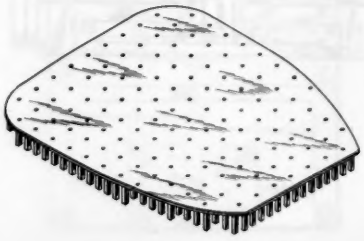


232,545
CARPET RETAINER
William S. Long III, 735 Carlton Ave., Plainfield, N.J. 07060
Filed Aug. 3, 1972, Ser. No. 277,516
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—7 R

232,546
WASTE WATER ANALYZER UNIT
Emil J. Gentelli, East Brunswick, Ronald D. Barbaro, Edison, and James T. Yeh, Hoboken, N.J., assignors to Princeton Aqua Science
Filed Apr. 11, 1972, Ser. No. 243,107
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—2



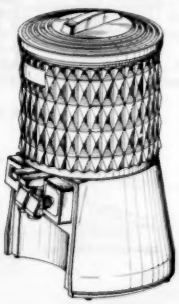
232,547
FLYSWATTER BLADE
Wilbert M. Walti, 25151 Sea Vista, Dana Point, Calif. 92629, and Reuben F. Speshyock, 30839 Calle Chueca, San Juan Capistrano, Calif. 92675
Filed Jan. 18, 1972, Ser. No. 218,858
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—20



232,548
FISH LURE
Earl E. Miller, Knoxville, Tenn., assignor to Brunswick Corporation, Skokie, Ill.
Filed Oct. 22, 1971, Ser. No. 191,968
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

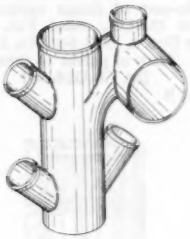
232,549
FISHING LURE
Anthony Vidler, 26 Chenies Close, Frant Road, Tunbridge Wells, Kent, England
Filed Aug. 6, 1973, Ser. No. 385,865
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

232,550
WATER PROCESSING APPLIANCE
Tomotsuro Fushihara, Tokyo, Japan, assignor to Sandeigurafe Co., Ltd., Tokyo, Japan
Filed Apr. 28, 1972, Ser. No. 248,799
Claims priority, application Japan Jan. 25, 1972
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



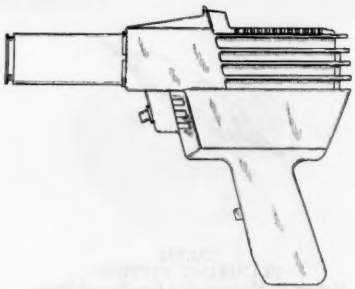
232,551
IN-LINE FILTER
Douglas U. Grover, 2910 Jerome Road, College Park, Ga. 30337
Filed Sept. 22, 1971, Ser. No. 182,935
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

232,552
PLUMBING FITTING
Robert R. Watson, 423 Knollwood Road, Tallmadge, Ohio 44278
Filed Dec. 13, 1972, Ser. No. 314,756
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40

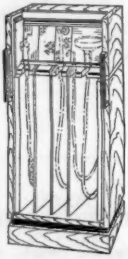


232,553
CONNECTOR FOR GUTTER DRAIN PIPE
Glenn Settle, % Melrose Supply & Metal Company, 1661 Guenther Road, Dayton, Ohio 45427
Filed July 10, 1972, Ser. No. 270,223
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—45

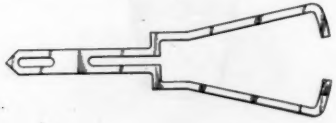
232,554
HEAT GUN
E. Burton Benjamin, Highland Park, Ill., assignor to Master Appliance Corporation, Racine, Wis.
Filed Oct. 19, 1972, Ser. No. 300,509
Term of patent 14 years
Int. Cl. D23—*03*; D28—*03*
U.S. Cl. D23—162



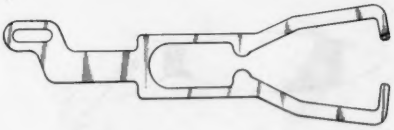
232,555
DENTAL CONSOLE
Ronald C. Webb, York, Pa., assignor to Dentsply Research & Development Corporation, Milford, Del.
Continuation-in-part of design applications Ser. Nos. 118,581 and 118,582, dated Feb. 24, 1971. This application Dec. 4, 1972, Ser. No. 312,009
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1 B



232,556
ELECTRICAL CONTACT
Donald E. Michel and James E. McKeown, Sidney, N.Y., assignors to The Bendix Corporation
Filed Feb. 17, 1972, Ser. No. 227,328
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 R

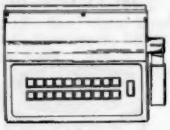


232,557
ELECTRICAL CONTACT
Donald E. Michel and James E. McKeown, Sidney, N.Y., assignors to The Bendix Corporation
Filed Feb. 17, 1972, Ser. No. 227,339
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 R

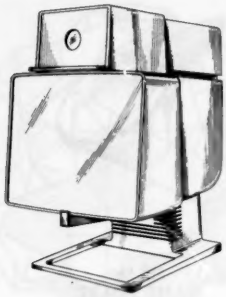


232,558
ADAPTER FOR INCANDESCENT LIGHT BULB
Terry Hermanson, New York, N.Y., assignor to Mr. Christmas Incorporated, New York, N.Y.
Filed Oct. 26, 1972, Ser. No. 301,148
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 G

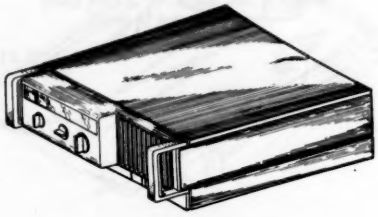
232,559
MICROFICHE ENCODER OR THE LIKE
Andrew Virgil McClare, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 22, 1972, Ser. No. 325,786
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



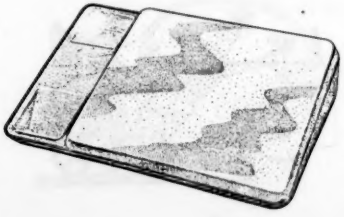
232,560
PICTURE TELEPHONE
Peter Maddock, Sollentuna, and Hans Sjoholm, Stockholm, Sweden, assignors to Telefonaktiebolaget L. M. Ericsson, Stockholm, Sweden
Filed July 19, 1972, Ser. No. 273,179
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



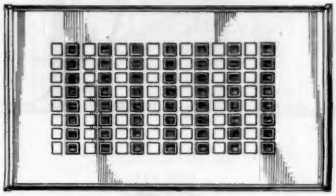
232,561
TWO-WAY RADIO OR SIMILAR ARTICLE
Martin C. Stessel, Schaumburg, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Mar. 26, 1973, Ser. No. 344,686
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 K



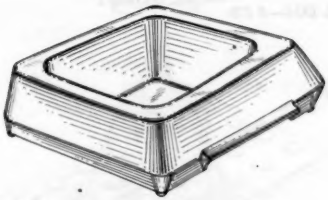
232,562
TELEPHONE STAND
Francis Stephen Doyle, Oaklandon, Ind., Donald Michael Genaro, Haworth, N.J., and Terrance Joseph Paas and Terry Brice Prince, Indianapolis, Ind., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.
Filed May 29, 1973, Ser. No. 364,703
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



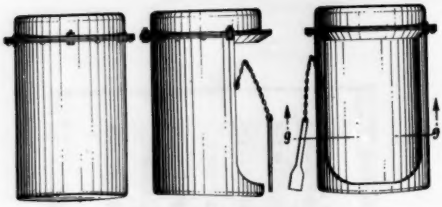
232,563
DIRECT STATION SELECTION CONSOLE
Paul Marchese, New York, N.Y., assignor to TIE/Communications, Inc., Stamford, Conn.
Filed July 18, 1973, Ser. No. 380,514
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



232,564
DOG DISH
Claud W. Kissin, Fort Lee, N.J., assignor to The Hartz Mountain Corporation, Harrison, N.J.
Filed Sept. 1, 1972, Ser. No. 285,893
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16

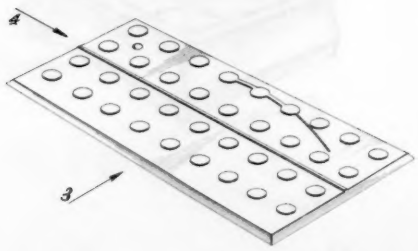


232,565
ANIMAL TOILET
Isobel K. Rosenberg, Woodslea R.D. 1, Landenberg, Pa. 19350
Filed Aug. 14, 1972, Ser. No. 280,496
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99



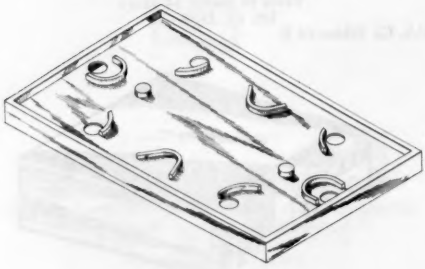
232,566
GOLF CLUB GRIP
Clifford A. Spencer, Akron, Ohio, assignor to Eaton Corporation, Cleveland, Ohio
Filed Sept. 11, 1972, Ser. No. 288,218
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GS

232,567
GOLFER'S TRAINING MAT
Steven T. Golden, 822 Teague Drive, Santa Paula, Calif. 93060
Filed Oct. 20, 1972, Ser. No. 299,591
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

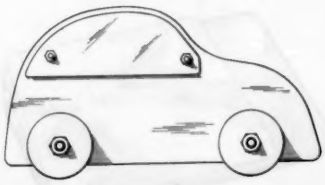


232,568
GOLF TEE HOLDER AND DRIVER HEAD PROTECTOR
Dwight C. Brown, 5712 N. 20th St., Arlington, Va. 22205
Filed May 8, 1973, Ser. No. 358,399
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GT

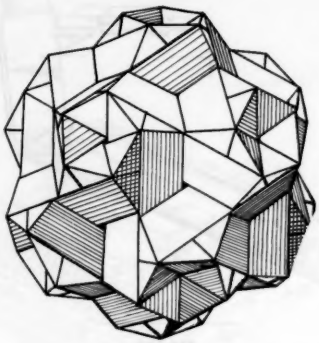
232,569
GAME BOARD
J. Henry Adams, 64 Onyx Ave., Walla Walla, Wash. 99326
Filed June 6, 1973, Ser. No. 367,565
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



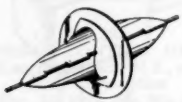
232,570
EDUCATIONAL TOY CAR
Joseph B. Kucera, Traer, Iowa, assignor of fractional part interest to Rudolph L. Lowell, Des Moines, Iowa
Filed Mar. 20, 1972, Ser. No. 236,561
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



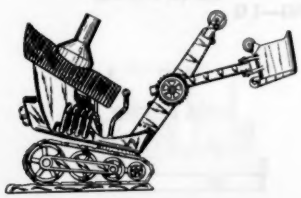
232,571
SPHERAL POLYHEDRAL INTERLOCKING PUZZLE
Stewart T. Coffin, Old Sudbury Road, Lincoln, Mass. 01773
Filed Apr. 14, 1972, Ser. No. 244,344
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



232,572
KITE
Albert J. Torsak, 628 Harpeth Knoll Road, Nashville, Tenn. 37221
Filed June 2, 1972, Ser. No. 259,363
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AF

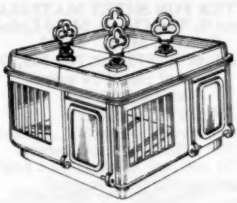


232,573
STYLIZED MODEL POWER SHOVEL
Eugene T. Daniel, Walnut, Calif., assignor to Monogram Models, Inc., Morton Grove, Ill.
Filed Aug. 31, 1972, Ser. No. 285,413
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 T

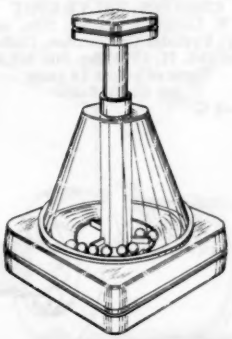


232,574
MUSICAL TOY
Michael Satten, 93—25 86th Road, Queens, N.Y. 11421
Filed Oct. 2, 1972, Ser. No. 294,338
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C

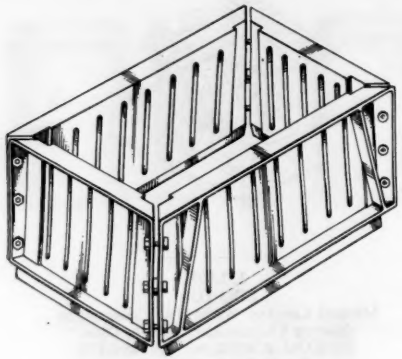
232,575
ZOO TOY
Michael Langieri, Butler, N.J., assignor to Questor Corporation, Toledo, Ohio
Filed Oct. 2, 1972, Ser. No. 294,422
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 A



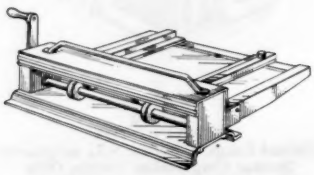
232,576
SPINNING TOY
Michael Langieri, Butler, N.J., assignor to Questor Corporation, Toledo, Ohio
Filed Oct. 2, 1972, Ser. No. 297,691
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 CC



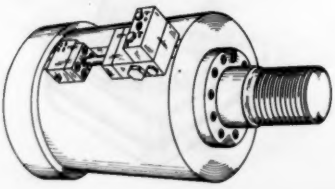
232,577
JACKET FOR FOUNDRY SAND MOLD
Wilmer J. Friesen and Frank A. Hulet, Hutchinson, Kans., assignors to M. W. Hartmann Manufacturing Co., Inc., Hutchinson, Kans.
Filed July 10, 1972, Ser. No. 270,321
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D54—8



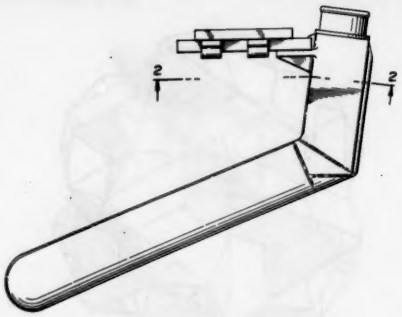
232,578
SLITTER FOR SHEET MATERIAL
Eugene H. Van Cleave, 24530 Lydon, Redford, Mich. 48239
Filed June 1, 1972, Ser. No. 263,394
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D55—1 A



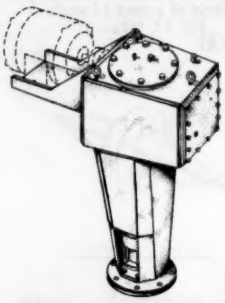
232,579
COMBINED HYDRAULIC CYLINDER AND CONTROL VALVE UNIT
Lawrence R. Landherr, Racine, Wis., assignor to Milwaukee Cylinder Corporation, Cudahy, Wis.
Filed Oct. 19, 1972, Ser. No. 300,855
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 G



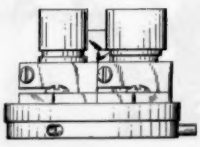
232,580
CONCRETE VIBRATOR
Hamilton J. Maginniss, 563 Russell Road, Mansfield, Ohio 44903
Filed Nov. 7, 1972, Ser. No. 304,384
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D55—1 D



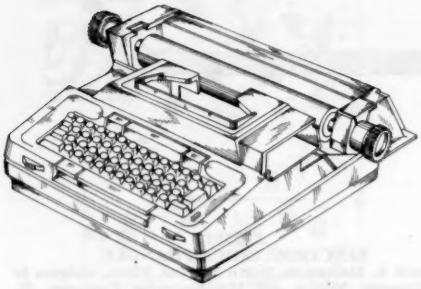
232,581
RIGHT ANGLE DRIVE AND PEDESTAL
John G. Fenic, Donald L. Kime, and William C. Raridan, Dayton, and Read C. Viemeister, Yellow Springs, Ohio, assignors to Chemineer, Inc., Dayton, Ohio
Filed Dec. 18, 1972, Ser. No. 316,030
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D55—1 D



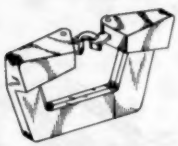
232,582
LENS CLUSTER UNIT FOR PHOTOPRINTING
Richard M. Artz, 3092 Silverton Road NE., Salem, Oreg. 97308
Filed Feb. 28, 1972, Ser. No. 230,205
Term of patent 7 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



232,583
TYPEWRITER
Chester J. Abend, Camillus, James J. Bienkowski, Cazenovia, and John E. Jolliffe, Manlius, N.Y., assignors to SCM Corporation
Filed Dec. 8, 1972, Ser. No. 313,203
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A

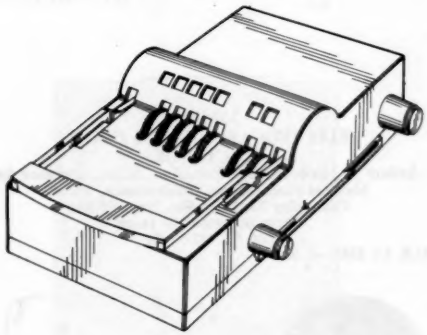


232,584
TYPEBAR CONTROL GUIDE
Scott J. Longrod, Ithaca, N.Y., assignor to SCM Corporation
Filed Dec. 26, 1972, Ser. No. 317,907
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A

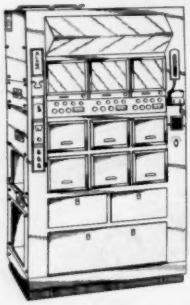


232,585
TYPEWRITER
James J. Bienkowski, Cazenovia, and Paul D. Younge, Horseheads, N.Y., assignors to SCM Corporation, New York, N.Y.
Filed Jan. 2, 1973, Ser. No. 320,385
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A

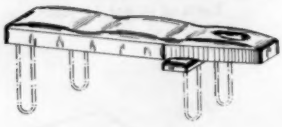
232,586
CHECKWRITER
Joseph K. Dikoff, 4 Privateer, Apt. 3, Marina Del Ray, Calif. 93933
Filed July 12, 1973, Ser. No. 378,777
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B



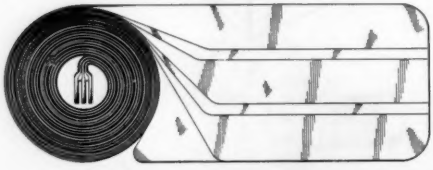
232,587
MODULAR MOBILE INTENSIVE CARE UNIT
John T. Schefke, 270 Lawton Road, Riverside, Ill. 60606, and Algimantas K. Boktys, 3218 W. Marquette Road, Chicago, Ill. 60629
Filed Jan. 3, 1972, Ser. No. 215,285
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 F



232,588
THERAPY TABLE TOP
Warren S. Radford, 29325 Edgedale Road, Pepper Pike, Ohio 44124
Filed Apr. 3, 1972, Ser. No. 240,897
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 D



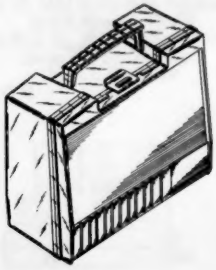
232,589
ELECTROCARDIOGRAM PLATE ELECTRODE
Arthur J. Hinnenkamp, Excelsior, Minn., assignor to Medical Plastics, Inc., Minnetonka, Minn.
Filed May 22, 1972, Ser. No. 255,963
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 F



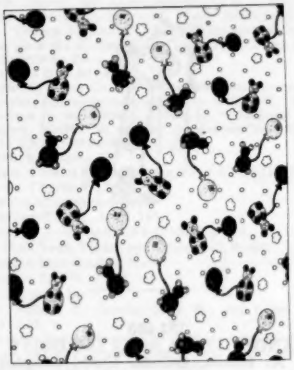
232,590
ELECTRODE PAD AND TAPE THEREFOR
Francis C. Moore, 7327 Galloway Drive 46250, and Leon R. Perkinson, 6305 Hillcrest Lane 46220, both of Indianapolis, Ind.
Filed July 27, 1972, Ser. No. 275,860
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 C

232,591
ELECTROSURGICAL HANDLE
Thomas A. Haberman, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Dec. 6, 1973, Ser. No. 422,299
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12 R

232,592
CARRYING CASE
Frank N. Rodriguez, Roselle, N.J., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Apr. 4, 1972, Ser. No. 241,104
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1 R



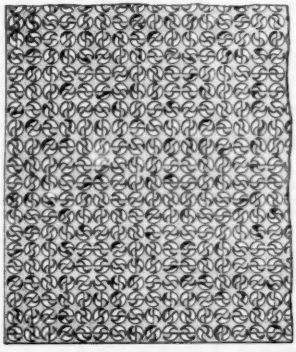
232,593
PLASTIC SHEET MATERIAL
Carol Stone, 30 W. 70th St.,
New York, N.Y. 10023
Filed June 9, 1972, Ser. No. 234,451
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D87—3 G



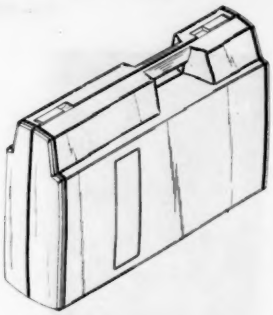
232,594
PLASTIC SHEET MATERIAL
Carol Stone, 30 W. 70th St.,
New York, N.Y. 10023
Filed June 9, 1972, Ser. No. 234,474
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D87—3 G

232,595
DEEP TEXTURED DECORATIVE LAMINATE
Jack August Willard, Hamilton, Ohio, assignor to
Formica Corporation, Cincinnati, Ohio
Filed Aug. 29, 1972, Ser. No. 284,692
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D87—3 G

232,596
SHEET MATERIAL
Raymond A. Krusinski, Coshocton, Ohio, assignor to
Pretty Products, Inc., Coshocton, Ohio
Filed Nov. 15, 1972, Ser. No. 306,736
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D87—3 G



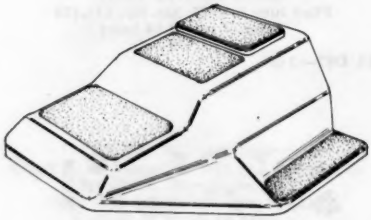
232,597
PROJECTOR CARRYING CASE
James H. Sias, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed July 28, 1972, Ser. No. 276,219
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—5 E



232,598
UMBRELLA HANDLE
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada
Filed Aug. 7, 1972, Ser. No. 278,436
Claims priority, application Germany Feb. 8, 1972
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3 A

232,599
STOP MOTION
Jose Castillo Deniega, Elmhurst, N.Y., assignor to Stop-Motion Devices Corporation, Plainview, Ill.
Filed Oct. 10, 1972, Ser. No. 296,520
Term of patent 14 years
Int. Cl. D15—*6*
U.S. Cl. D92—15

232,600
CANOPY FOR A BOAT JET DRIVE
Ralph A. Rhoda, Orinda, Calif., assignor to Berkeley Pump Company, Berkeley, Calif.
Filed Nov. 20, 1972, Ser. No. 308,106
Term of patent 7 years
Int. Cl. D15—*99*
U.S. Cl. D77—1 R



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PATENTS WERE ISSUED ON THE 27TH DAY OF AUGUST, 1974

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Abbott Laboratories: *See—*
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Abe, Takeshi, to Ricoh Co. Ltd. Microfiche film detection device for micro-readers and micro-reader-printers. 3,832,528, Cl. 235-61.11e.

Abrams, Edwin F.; and Shaver, Robert G., to General Technologies Corporation. Method of making microcrystalline fluoride fibers. 3,832,451, Cl. 423-489.000.

Ace Controls, Inc.: *See—*
Meldrum, Charles R.; and Bindon, Glyn A., 3,831,920.
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Adam, Marie Henri Hubert, to Societe Anonyme l'Eclairage Technique. Lighting fixture having a lamp support independent of the reflector. 3,832,538, Cl. 240-25.000.

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Adamson, David L.; and Tuddenham, William M., to Kennecott Copper Corporation. Electrowinning cell and method with provision for electrolyte circulation. 3,832,296, Cl. 204-106.000.

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Addressograph-Multigraph Corporation: *See—*
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Aerojet-General Corporation: *See—*
Kays, David D.; Frank, Kurt F.; and Longwell, Paul A., 3,832,289.

Aeronautical Research Associates of Princeton, Incorporated: *See—*
Donaldson, Coleman Dup; and Snedeker, Richard S., 3,831,396.

Afifi, Mostafa S.; and Jacobs, Allan, to Page Communications Engineers, Inc. Wide angle scanning and multibeam single reflector. 3,832,715, Cl. 343-761.000.

AGA Corporation: *See—*
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Janssens, Wilhelmus; Vanheertum, Johannes Josephus; Poot, Albert Lucien; and Pollet, Robert Joseph, 3,832,171.

Ahlen, Karl Gustav, to S.R.M. Hydromekanik Aktiebolag. Hydromechanical transmissions including torque converter having releasable pump or turbine combined with holding clutch gears. 3,831,463, Cl. 74-732.000.

Aidlin Automation Incorporated: *See—*
Aidlin, Samuel S.; Aidlin, Stephen H.; Hartzog, Melvin; and Shepard, John C., 3,831,738.

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Aidlin, Stephen H.: *See—*
Aidlin, Samuel S.; Aidlin, Stephen H.; Hartzog, Melvin; and Shepard, John C., 3,831,738.

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Airless Spray Tip Manufacturing Co.: *See—*
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Aisin Seiki Kabushiki Kaisha: *See—*
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Suzuki, Akira, 3,831,700.

Akamatsu, Kiyoshi; Maruta, Masayasu; and Yonekura, Yasushi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of printing plate of photosensitive resin. 3,832,177, Cl. 96-35.100.

Akase, Takeshi: *See—*
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Akerblom, Carl-Artur, to Allmanna Svenska Elektriska Aktiebolaget. Method of manufacturing an object of silicon steel having low sulphur content. 3,832,245, Cl. 148-113.000.

Akima, Akira; Nishikawa, Masao; Sato, Makoto; Miyahara, Hiromitsu; and Miyakawa, Yoshitaka, to Honda Giken Kogyo Kabushiki Kaisha. Fluid pressure accumulating apparatus. 3,832,095, Cl. 417-307.000.

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Albert, Jean: *See—*
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Albertus, Gundorph, to Smidth, F. L., & Co. Abrasion of caking. 3,831,326, Cl. 51-320.000.

Alburn, Harvey E.; Clark, Donald E.; Grant, Norman G.; and Lapidus, Milton, to American Home Products Corporation. Hydroxamic acid derivatives of 1-aminocyclohexanecarboxylic acid. 3,832,373, Cl. 260-453.00r.

Aleksandar, Manoilov; and Mustafa, Karsik. Machine for production of high voltage fuses without insulating chaplet and with melting elements of different cross section. 3,831,251, Cl. 29-203.00r.

Alessi, Vincent J. Dovetail slide. 3,832,019, Cl. 308-3.00a.

Alexander, Robert R.: *See—*
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Alexandrov, Alexandr Sergeevich: *See—*
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Alexandrov, Jury Nikolaevich: *See—*
Bogdanov, Evdokim Stepanovich; Alexandrov, Alexandr Sergeevich; Schegolevatykh, Vadim Dmitrievich; Saveliev, Vyacheslav Ivancvich; Zakharov, Mikhail Fedorovich; Alexandrov, Jury Nikolaevich; Korsetsky, Gennady Mikhailovich; and Kucher, Arnold Arkadievich, ,831,418.

Alferov, Jury Fedorovich: *See—*
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Alfredeen, Uno Allan, to Scandinavian Paper Converting AB. Thread cutting apparatus. 3,831,214, Cl. 10-89.00h.

Aliprandi, Lucio M. Electronic apparatus for programmed automatic playing of musical accompaniment systems. 3,832,479, Cl. 84-1.030.

Allard, Gordon H., to Waukesha Foundry Company, Inc. Discharge means for agricultural foam. 3,831,859, Cl. 239-592.000.

Allegheny Ludlum Industries, Inc.: *See—*
Bishop, Harry L., Jr., 3,832,160.

Allgaier, Rudolf; Brambilla, Luigi; and Scholz, Hans Jurgen, to Daimler-Benz Aktiengesellschaft. Inflatable gas cushion for passenger protection of vehicles, especially motor vehicles. 3,831,972, Cl. 280-150.0ab.

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Allum, Keith George; Hancock, Ronald David; McKenzie, Samuel; and Pitkethl, Robert Chalmers, to British Petroleum Company, The. Hydroformylation process. 3,832,404, Cl. 260-604.0hf.

Alroy, John D. Thermoforming machine with articles trimmed in-place. 3,832,102, Cl. 426-292.000.

Aluminum Company of America: *See—*
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Back, Karl Johan, to Oy Cyklop AB. Device for pressing together goods supported on conveyor. 3,831,511, Cl. 100-7.000.

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Baer, John S., to Warner Electric Brake & Clutch Company. Clutch and coupling unit. 3,831,724, Cl. 192-56.00c.

Baginski, Martin R., to Ashtabula Bow Socket Company. Steering assembly. 3,831,979, Cl. 280-279.000.

Bailey, Frank Gordon, to C.I.C. Ralphs Ltd. Method of shoe lasting. 3,831,215, Cl. 12-145.000.

Bailey, James R.: *See—*
Klein, Carl F.; and Bailey, James R., 3,832,709.

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Baker, Elizabeth Ann; Wluka, David Jankiel; and Tankey, Howard William, to Imperial Chemical Industries of Australia and New Zealand Limited. Dispersion comprising pigment, organic liquid and polymeric deflocculating agent. 3,832,209, Cl. 106-308.00q.

Baker, Harold R., to Norris Industries. Welding apparatus and welder head. 3,832,516, Cl. 219-81.000.

Baker Perkins Inc.: *See—*
Ingram, Charles E.; Gendron, Roger J.; Cronk, Vern V.; and Keefe, Harry J., 3,831,293.
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Baker, Sherman F.; and Hess, Frederick D., Jr., to McDonnell Douglas Corporation. Aircraft engine suspension system. 3,831,888, Cl. 244-54.000.

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Bakke, Even, to Slick Corporation, The. Dust collector including diffuser assembly. 3,831,354, Cl. 55-418.000.

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Mlinko, Sandor; Banfi, Dezso; Dobis, Emilia; Ottinger, Jozsef; Payer, Karoly; Palagyi, Tivadar; and Turi, Agnes, 3,832,137.

Baran, John S.; and Pitzele, Barnett, to Searle, G. D., & Co. 3,11-Dioxooleana-5,12-dien-30-oic acid, esters thereof and derivatives. 3,832,382, Cl. 260-468.500.

Baremor, Jerry F., to Eaton Corporation. Limited slip differential. 3,831,462, Cl. 74-711.000.

Bariko, John, to Westinghouse Electric Corporation. Nuclear techniques for detecting the presence of explosives. 3,832,545, Cl. 250-312.000.

Barnes, Gerald, to Amerace Esna Corporation, mesne. Power driven magnetic conveyor. 3,831,736, Cl. 198-41.000.

Barnette, Stanley Ronald. Self-reinforced plastic articles with core envelopment. 3,832,264, Cl. 161-41.000.

Barr and Stroud Limited: *See—*
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Barr, Donald L.: *See—*
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Barrer, Richard M.: *See—*
Yum, Su Il; Buckles, Richard G.; and Barrer, Richard M., 3,831,600.

Barrett, William J.; and Green, Harold, to Woodward Governor Company. Slip detection system. 3,832,609, Cl. 318-52.000.

Bartlett, William G.: *See—*
Mangan, Edmund L.; and Bartlett, William G., 3,832,549.

Bartlett, William G.; and Mangan, Edmund L., to Bethlehem Steel Corporation. Wide range radiation gage having a controlled-gain photodetector for determining a material property. 3,832,542, Cl. 250-363.000.

Bartlett, William G.; Hoffman, Carvel D.; Jones, Duane T.; and Mangan, Edmund L., said Jones assor to Bethlehem Steel Corporation. Wide-range radiation gage for determining deviation of a material property with a controlled-gain detector in an interruptabl self-balancing measuring loop. 3,832,550, Cl. 250-358.000.

Bartlett, William G.; and Mangan, Edmund L., to Bethlehem Steel Corporation. Radiation gage with sample and hold feature in deviation measuring circuit. 3,832,551, Cl. 250-359.000.

Bartley, Thomas S.; Descary, John Gilbert; Futcher, R. James; and Krishnan, R. Gopala, to International Paper Company. Method for producing nonwoven fabrics. 3,832,283, Cl. 162-211.000.

Barton, Bruce E.; and Cardwell, Paul H., to Deepsea Ventures, Inc. Fused salt electrolysis to obtain manganese metal. 3,832,295, Cl. 204-64.00r.

Baseley, Edward, to Lee, Raymond, Organization, Inc., The. Lunar shelter. 3,831,581, Cl. 126-270.000.

BASF Wyandotte Corporation: *See—*
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Bass, Sidney; and Rich, Hubert A., to Mattel, Inc. Pneumatic toy stove accessory. 3,831,314, Cl. 46-14.000.

Bassett, Marion Geraldine Currie; and Orr, Alfred Thorburn. Light control device. 3,832,541, Cl. 240-106.00r.

Batter, John F., Jr.; Mason, Paul B.; Stella, Joseph A.; Thomas, Paul W., Jr.; and Wright, Joseph H., to Polaroid Corporation. Processing composition release mechanism for film cassette comprising self-contained film processing system. 3,832,048, Cl. 352-10.000.

Battisti, Sylvester J., to Ford Motor Company. Liquid-to-liquid heat exchanger. 3,831,672, Cl. 165-154.000.

Bauer, Gunther; Kramer, Lothar; and Kuhn, Helmut, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of crimped fibers and filaments of linear high molecular weight polymers. 3,832,435, Cl. 264-168.000.

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Baxendale, Kenneth C., to Gleason Works, The. Tooling for receiving and supporting a quantity of powder material to be pressed into a self-supporting compact. 3,832,100, Cl. 425-78.000.

Baxter, Alan William: *See—*
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Bayer, John William, to Owens-Illinois, Inc. Barrier polymers having high heat distortion temperatures. 3,832,335, Cl. 260-80.810.
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Bazin, Bernard; and Albert, Jean, to Texas Instruments Incorporated. Method of fabrication of insulated gate field effect transistors. 3,832,248, Cl. 148-187.000.
BBC Aktiengesellschaft Brown, Boveri & Cie: *See—*
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BBC Brown Boveri & Company, Limited: *See—*
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Beauplat, Philippe Louis. Punch tool. 3,831,483, Cl. 83-698.000.
Beck, David F.: *See—*
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Beck, Frederick R., to McGill Manufacturing Company, Inc. Microlever switch operator. 3,832,508, Cl. 200-332.000.
Beck, Hans (Stahlbau-Fertigbau): *See—*
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Beck, Siegfried; and Siebold, Manfred, to Bosch, Robert, GmbH. Control valve unit in pneumatic braking system. 3,832,015, Cl. 303-40.000.
Becker, Rudolf, to Linde Aktiengesellschaft. Method of and system for the emptying of liquefied-gas vessels, especially the tanks of a tank ship. 3,831,811, Cl. 222-1.000.
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Bedi, Ram D. Composite self-locking fastener. 3,831,213, Cl. 10-10.00p.
Beech, Frank: *See—*
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Belcher, Richard A., to Chase-Shawmut Company, The. Blown fuse indicator for high-voltage fuses. 3,832,665, Cl. 337-244.000.
Bell & Howell Company: *See—*
Haake, Robert, 3,832,047.
Bell, Oliver A., Jr.; and Gilleland, Randall C., to Colt Industries Operating Corporation. Short circuit protection system for electrical discharge machining apparatus. 3,832,511, Cl. 219-69.00r.
Bell Telephone Laboratories, Incorporated: *See—*
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Bello, Hobson Joseph, Jr.; and Smith, Albert Charles, Jr., to Eastman Kodak Company. Photographic processes and elements. 3,832,174, Cl. 96-22.000.
Beloit Corporation: *See—*
Brenner, Lawrence A., 3,832,213.
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Bengtsson, Sigurd W. Spring fastener. 3,831,225, Cl. 24-73.00p.
Bennett, Dale L.: *See—*
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Bennett, Joseph J.; and Trapp, Alvin A. Wire pulling apparatus. 3,831,877, Cl. 242-86.50r.
Bense, William M., to Leesona Corporation. Take-up system. 3,831,873, Cl. 242-45.000.
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Bentley, Richard Lee; and Stubert, John Wesley, to Chicago Bridge & Iron Company. Gasket for closure seal. 3,831,950, Cl. 277-75.000.
Bercik, Paul G.; and Henke, Alfred M., to Gulf Research & Development Company. Isobutylene dimerization process. 3,832,418, Cl. 260-683.15r.
Berezovsky, Mikhail Elevich: *See—*
Medovar, Boris Izrailevich; Lanevsky, Valery Evgenievich; Alferov, Jury Fedorovich; Dubinsky, Rudolf Solomonovich; Berezovsky, Mikhail Elevich; Chekotilo, Leonty Vasilievich; Pavlov, Leonid Viktorovich; Ishunkin, Veniamin Alexandrovich; Shevtsov, Anatoly Ianovich; and Grinshpon, Semen Yakovlevich, 3,832,476.
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Berg, Laader, to Unifoam AG. Apparatus for producing polyurethane foam. 3,832,099, Cl. 425-4.00c.
Berg, Leo; Lenemann, Gerhard Johann; and Kinneging, Johannes Wilhelmus, to Knapsack Aktiengesellschaft. Filling nozzle and installation for filling drums with liquid yellow phosphorus. 3,831,644, Cl. 141-82.000.
Bergman, Imanuel, to National Research Development Corporation. Gas detecting electrode assembly. 3,832,299, Cl. 204-195.00p.
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Hirz, Albert; Handrick, Kurt; and Kolling, Georg, 3,832,360.
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Berkey Photo, Inc.: *See—*
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Berkhouse, Thomas W., to International Paper Company. Display card. 3,831,300, Cl. 40-21.00b.
Berkowitz, Ami E.; and Meiklejohn, William H., to General Electric Company. Non-impact, curie point printer. 3,832,718, Cl. 346-74.0mt.
Berkowitz, Lawrence; Novickis, Georgs; and Sheth, Prafulchandra N., to Dickson Paper Fibre, Inc., mesne. Trash separating apparatus. 3,831,748, Cl. 209-12.000.
Berman, Herbert S., to Westinghouse Electric Corporation. Silicon carbide junction thermistor. 3,832,668, Cl. 338-22.0sd.
Bernhardt, Brian M.; and Genzel, Edward A. Universal coupling. 3,831,982, Cl. 280-511.000.
Bernstein, Benjamin T.; Crawshaw, James R.; and McCurry, Morris H., to Union Specialty Machine Company, mesne. Sewing machine motor and control circuit. 3,832,613, Cl. 318-269.000.
Besenfelder, Edward R., to Honeywell Information Systems, Inc. Apparatus for detecting data bits and error bits in phase encoded data. 3,832,684, Cl. 340-146.1ab.
Besser Company: *See—*
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Beurrier, Henry Richard, to Bell Telephone Laboratories, Incorporated. Signal distribution network. 3,832,647, Cl. 330-30.00r.
Bevington, Richard E., Jr., to Eastman Kodak Company. Sheet plicating device. 3,831,501, Cl. 93-1.00c.
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Bhuta, Pravin G.; Johnson, Robert L.; and Graham, Douglas J., to TRW Inc. Surface tension method of and apparatus for separating immiscible liquids. 3,831,756, Cl. 210-109.000.
Bianchetta, Donald L.; and Lohbauer, Kenneth R., to Caterpillar Tractor Co. Valve disabling device. 3,831,620, Cl. 137-269.000.

Biber, Rupert, to Beck, Hans (Stahlbau-Fertigbau). Portion positioning apparatus, especially for dough portions. 3,831,778, Cl. 214-1.0bd.

Bilgutay, Ilhan M. Bar code font. 3,832,686, Cl. 340-146.30z.

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Binford, Jack C.; Ethridge, Frederick A.; and Talbot, James R., to Fiber Industries, Inc. Method for producing a yarn having latent bulking characteristics. 3,831,231, Cl. 28-72.140.

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Bird, John Lee. Propeller shaft lock. 3,831,547, Cl. 115-43.000.

Birkenbach, Eugen J., to International Harvester Company. Disk gang coupling for harrows and the like. 3,831,685, Cl. 172-568.000.

Bishop, Harry L., Jr., to Allegheny Ludlum Industries, Inc. Decarburizing molten steel. 3,832,160, Cl. 75-60.000.

Bittner, Herbert, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Armored tubing with helical or circular corrugation. 3,831,636, Cl. 138-173.000.

Bittner, Louis M. Gear driven cylindrical drum chance device. 3,831,947, Cl. 273-143.00r.

Bjalme, Bengt G.; and Brown, Thomas G., to Reed Manufacturing Company. Plastic pipe assembly tool. 3,831,256, Cl. 29-237.000.

Black Clawson Company, The: *See—*
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Blanton, Bobby D., to Texas Instruments, Incorporated. Thermostatic switch. 3,832,667, Cl. 337-354.000.

Blomstrand, Paul R., to ACF Industries Incorporated. Apparatus for testing the operation of the defrost switch in an air conditioning unit. 3,831,391, Cl. 62-125.000.

Bloom, Gordon Norman. Building element aligner and mortarizer. 3,831,819, Cl. 222-176.000.

Blundell, Bill J.: *See—*
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Boardman, Albert. Aging calculator. 3,831,839, Cl. 235-8.800.

Boaz, Donald P. Silicate polymer vehicles for use in protective coatings and process of making. 3,832,204, Cl. 106-287.0se.

Bobeck, Andrew Henry; and Nelson, Terence John, to Bell Telephone Laboratories, Incorporated. Transfer circuit for single wall domains. 3,832,701, Cl. 340-174.0tf.

Bober, Thomas W': *See—*
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Boggs, Roger L.: *See—*
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Boggs, Roger L.; Balzer, David John; and Haslett, Glenn Melvin, to Caterpillar Tractor Company. Method of installing vented plugs in pin bores. 3,831,240, Cl. 29-148.300.

Boggs, Roger L.; and Burk, Duane L., to Caterpillar Tractor Company. Method and apparatus for assembling welded track hinge joints. 3,831,257, Cl. 29-401.000.

Bohman, Gote Hubert, to B. V. Foco Nederland. Load-carrier. 3,831,794, Cl. 214-516.000.

Bohrdt, Joaquin: *See—*
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Bondi, Emanuele, to Fieldcrest Mills, Inc. Method of producing patterned blocks of pile yarns in making patterned pile fabrics. 3,831,232, Cl. 28-72.00r.

Bonnett, Robert N.: *See—*
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Books, William C., to Bethlehem Steel Corporation. Method for preventing early damage to furnace refractory shapes. 3,832,478, Cl. 13-35.000.

Boone, Ralph D. Reciprocating cable alignment actuator. 3,831,623, Cl. 137-344.000.

Booth, Robert Arthur: *See—*
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Bopp, Warren G., to Eaton Corporation. Hydrokinetic coupling sleeve seal. 3,831,378, Cl. 60-353.000.

Borders, Donald Bruce: *See—*
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Borg-Warner Corporation: *See—*
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Bourgoin, Guy, to Societe Anonyme D.B.A. Antiskid braking circuit. 3,832,012, Cl. 303-21.00f.

Bowden, Ralph H. Transistor beta measuring instrument. 3,832,633, Cl. 324-158.00t.

Bowen, David, Jr.: *See—*
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Bowen, Russell J.; Ford, William B., Jr.; Sanborn, Ralph D.; Sawyer, Winslow A.; Sharp, John R.; Soini, Herbert E.; Lambert, Benjamin A.; and Lull, David B. Biological bomb. 3,831,520, Cl. 102-6.000.

Bowles, Arnold G., to National Forge Company. Isostatic press. 3,832,103, Cl. 425-405.00h.

Bowser, George H.; and Mazzoni, Renato J., to PPG Industries, Inc. Method of making a multiple glazed unit having a thermoplastic, spacer-dehydrator element. 3,832,254, Cl. 156-107.000.

Boyajian, Alfred Z., to Stanley Works, The. Multipurpose pliers. 3,831,207, Cl. 7-5.500.

Boyd, Clinton A.; and Tijenelis, Donatas, to Borg-Warner Corporation. High temperature, high pressure oil well cable. 3,832,481, Cl. 274-102.00r.

Boyd, Edward A.; and Harkness, Joseph R., to Briggs Stratton Corporation. Method of making an electric motor armature core. 3,831,268, Cl. 29-598.000.

Boyd, Herman L., 45% to McAnally, Raymond H., 5% to Selmin, Allen C., 5% to Schneider, Harry and 5% jointly to Jefcoat, I. A., and Thais, Richard R. Multipurpose vaginal and cervical device. 3,831,587, Cl. 128-6.000.

Boyden, Willis Guild; and Shaw, Richard Astourre, to North American Electronics Corporation. Inverter-converter power supply system. 3,832,623, Cl. 321-45.00r.

Boyle, Kenneth Hector McKinnon; and Rogers, Thomas, to Barr and Stroud Limited. Apparatus for measuring the area between a fluctuating signal and an inclined baseline. 3,831,590, Cl. 128-2.50r.

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Brenden, Byron B.; Neely, Victor I.; and Garlick, George F., to Holosonics. Scanning mid frequency acoustical prospecting method. 3,832,677, Cl. 340-15.5tn.

Brenner, Lawrence A., to Beloit Corporation. Method for applying glue to leading and trailing edges of a wrapper sheet. 3,832,213, Cl. 117-44.000.

Breslow, David S., to Hercules Incorporated. Nitrile imines. 3,832,399, Cl. 260-566.00d.

Bresnahan, Eileen E.; Lias, Nicholas C.; Kolb, Ernest D.; and Laudise, Robert A., said Bresnahan and said Lias assors. to Western Electric Company Incorporated and said Kolb and said Laudise assors. to Bell Telephone Laboratories Incorporated. High pressur hydrothermal growth of quartz with high 'Q' values. 3,832,146, Cl. 23-301.00r.

Breton, Roger J.; and Beck, David F., to Roto Manufacturing, Inc. Method for coring and pressing juice from fruits having a rind. 3,831,515, Cl. 100-37.000.

Brewer, John C., to Garbalizer Corporation of America. Waste removal vehicle and structure associated therewith. 3,831,789, Cl. 214-82.000.

Brey, Wilhelm; Hostetler, William; Loeffler, Earl Ferdnand; Kolm, Hubert Ernest; and Elder, Fred Grove, to Firestone Tire & Rubber Company, The. Materials handling assembly. 3,832,261, Cl. 156-405.000.

Breysse, Jacques; and Roget, Jean, to Rhone-Poulenc S.A. Separation apparatus. 3,831,763, Cl. 210-321.000.

Briar, John R.; and Grabek, Frederick M., to General Motors Corporation. Electromagnetic spring-wound clutch. 3,831,723, Cl. 192-35.000.

Bridgestone Tire Company Limited: *See—*
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Brok, Wilhelm Fredrik; Spanjersberg, Arie Adriaan; and Van Staveren, Joannes, to De Staat der Nederlanden ten deze vertegenwoor digd door de Directeur-Generaal der Posterijen, Telegrafie & Telefonie. Reading apparatus. 3,832,682, Cl. 340-146.3ed.

Brondy, Thomas L.; and Cole, Andrew T. Retrograde renal biopsy device. 3,831,585, Cl. 128-2.00b.

Brookman, Roger S., to American Precision Industries, Inc. Pneumatic rapper. 3,831,686, Cl. 173-132.000.

Brothers, Jack; and Fuzia, Walter J. Strapping severing tool. 3,831,280, Cl. 30-296.00r.

Broussard, Pat J.; and Fincher, Arnold, to Halliburton Company. High temperature, low density cement composition. 3,832,196, Cl. 106-89.000.

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Brown, Kenton J.: *See—*
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Brown, Patrick Michael, to Grace, W. R. & Co. Method of coating pressed vermiculite with a glaze composition. 3,832,224, Cl. 117-123.00a.

Brown, Robert A.; Jepson, John W.; and Lyon, Herbert W., to Acushnet Company. Method of making golf ball molds. 3,831,423, Cl. 72-358.000.

Brown, Thomas G.: *See—*
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Brown, Vernon L.; and Pearce, Joseph L., to Otis Engineering Corporation. Stuffing box for wireline well apparatus. 3,831,676, Cl. 166-82.000.

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Bruelemans, Karel B., to Fabrique Nationale Herstal S.A. en abrege FN. Device for producing simultaneously two separate fabrics rib on the same head of a rib knitting machine with two needle beds. 3,831,403, Cl. 66-126.00r.

Bryngdahl, Olof, to Xerox Corporation. Self-imaging with an optical tunnel for image formation. 3,832,029, Cl. 350-96.00t.

Bucalo, Louis, to Investors in Ventures, Inc. Devices for controlling fluid flow in living beings. 3,831,584, Cl. 128-1.00r.

Buchanan, James E.; and Nelson, Carl W., to Westinghouse Electric Corporation. Low cost digital to synchro converter. 3,832,707, Cl. 340-347.0da.

Buchel, Karl Heinz: *See—*
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Burdges, Kenneth P.; and Robertson, Arthur J., Sr., to Lockheed Aircraft Corporation. Airfoil with extendible and retractable leading edge. 3,831,886, Cl. 244-42.0cc.

Burdick, Robert E.; Baker, Terry M.; and Wolfe, Baxter K., to Rolair Systems, Inc. Automated assembly line with air cushion devices. 3,831,525, Cl. 104-23.0fs.

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Burkin, Jury Alexandrovich; and Seleznev, Jury Emelyanovich. Apparatus for making memory storage matrices. 3,831,253, Cl. 29-203.00m.

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Burns, Brian N. Strap cutter for leather and like material. 3,831,279, Cl. 30-280.000.

Burny, Camille J., Jr. Clip for forming simulated slipknot. 3,831,201, Cl. 2-150.000.

Burroughs Corporation: *See—*
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Burst, Robert A. Putty conditioning method and apparatus. 3,831,908, Cl. 259-191.000.

Burtnyk, Victor: *See—*
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Burton, Frank L., to Gates Rubber Company, The. Personnel protection sleeve. 3,831,635, Cl. 138-114.000.

Bustamante, Sebastian R., 20% to Lee, Raymond, Organization, Inc., The. Lightweight boat moving device. 3,831,211, Cl. 9-1.00t.

Butler Creek Company: *See—*
Vissing, Ellin D., 3,831,285.

Butler, Miles F.; and Corcia, John T. Petalite-spodumene-potassium silicate cement for bonding metal to glass. 3,832,195, Cl. 106-74.000.

Butler, William F., to Cutter Laboratories, Inc. Trocar-cannula. 3,831,814, Cl. 222-81.000.

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Byzov, Gennady V.; Valdman, Ilya V.; Mazurovsky, Boris Y.; and Yakibjuk, Ivan E. Method of bending heat exchanger sections and a machine for the realization thereof. 3,831,420, Cl. 72-305.000.

Caillet, Rene. Water-tight closing device. 3,831,544, Cl. 114-202.000.

Cain, Gerald E. Water ski towline pay-out and retrieval apparatus. 3,831,545, Cl. 114-235.0ws.

Calcaro, Louis A., to Rockwell Manufacturing Company. Fire extinguishing system nozzle. 3,831,682, Cl. 169-37.000.

Calder, Oliver J., to Airless Spray Tip Manufacturing Co. Spray tip. 3,831,862, Cl. 239-526.000.

Califano, Frank L.; Stepien, George, Jr.; and Russell, Thomas E., to Flintkote Company, The. Method for reducing water loss through soil by seepage. 3,831,382, Cl. 61-1.00r.

Calton, Marion R.: *See—*
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Cambrian Housewares Limited: *See—*
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Camelec Limited: *See—*
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Campbell, Roger W.: *See—*
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Campbell, Roger W.; Aukmanis, Edvards B.; and Placko, Milan, to General Motors Corporation. Steering actuator for tandem axles. 3,831,963, Cl. 280-81.00a.

Campbell, Roger W.; Aukmanis, Edvards B.; and Placko, Milan, to General Motors Corporation. Swivel assembly for steerable axle. 3,831,964, Cl. 280-81.00a.

Canadian National Railway Company: *See—*
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Canadian Patents and Development Limited: *See—*
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Canella, Luigi, to Italimpianti Societa Italiana Impianti p.a. Bulk material blending and reclaiming apparatus. 3,831,735, Cl. 198-36.000.

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Canon Kabushiki Kaisha: *See—*
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Nagamatsu, Katsumi; and Saito, Takashi, 3,832,170.
Nishide, Katsuhiko; Yamanouchi, Teruo; and Kinjo, Kikuo, 3,832,172.

Cantz, Rudolf, to Kennametal Inc. Anti skid element for a vehicle tire. 3,831,655, Cl. 152-210.000.

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Carborundum Company, The: *See—*
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Kane, William S.; and Cardwell, Paul H., 3,832,165.

Carlson, Norman R.; and Ronnen, Uri G., to Westinghouse Electric Corporation. On-line hybrid computer arrangements having universal interfacing capability for electric power system studies. 3,832,533, Cl. 235-151.210.

Carlson, Norman R.; Zitelli, William E.; and Burtnyk, Victor, to Westinghouse Electric Corporation. Computation of power system load flows and transient stability. 3,832,534, Cl. 235-151.210.

Carpetech Corporation: *See—*
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Carre, Jean-Jacques, to Societe Anonyme D. B. A. Hydraulic servomotor. 3,831,494, Cl. 91-434.000.

Carson, Randolph Charles, to Beckman Instruments, Inc. Method of welding coated wires to electrical conductors. 3,832,517, Cl. 219-92.000.

Carter, Daniel G. Jr., to United States of America, Atomic Energy Commission. Method for the suppression of hydrogen during the dissolution of zirconium and zirconium alloys. 3,832,439, Cl. 423-4.000.

Carwile, Paul, to Brown & Williamson Tobacco Corporation. Transition chute. 3,832,004, Cl. 302-28.000.

Case, John N. Catamaran and method of making. 3,831,540, Cl. 114-77.00r.

Caserio, Frederick F., Jr.: *See—*
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Casey, Robert J., to United States of America, Navy. Vented plunger atomizer. 3,831,858, Cl. 239-464.000.

Casio Computer Kabushiki Kaisha: *See—*
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Cass, George Robert, to Canadian National Railway Company. Combined digital-analogue speedometer. 3,832,635, Cl. 324-166.000.

Castellanos, Leopold J., to Esso Production Research Company. Swivel joint connection. 3,832,073, Cl. 403-121.000.

Casull, Richard J. Revolver cylinder lock. 3,831,305, Cl. 42-67.000.

Caterpillar Tractor: *See—*
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Caterpillar Tractor Co.: *See—*
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Muller, Thomas P.; and Sitton, Ellis A., 3,831,718.
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Satzler, Ronald L.; and Calton, Marion R., 3,831,459.

Cator, Dennis W.; Campbell, Roger W.; and Felix, Gerardus L., to General Motors Corporation. Steerable tandem axle suspension. 3,831,962, Cl. 280-81.00a.

C.A.V. Limited: *See—*
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Cavalier Corporation: *See—*
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Cavallo, Roger Paul Charles, to Synthelabo. Control device for a respiratory apparatus. 3,831,596, Cl. 128-145.800.

Cederquist, Alf L.; and Devlin, Shaun S., to Ford Motor Company. Time division interpolator. 3,832,640, Cl. 328-83.000.

Cellerini, Albert R.; and Dobrosielski, Stephen S., to Westinghouse Electric Corporation. Circuit breaker with spring closing means and pawl and rachet spring charging means. 3,832,504, Cl. 200-153.0sc.

Cellier, Francis: *See—*
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Centronics Data Computer Corporation: *See—*
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Cerankowski, Leon D.; and Mattucci, Neil, to Polaroid Corporation. Novel photographic products and processes. 3,832,173, Cl. 96-3.000.

Cernek, Edward, Jr., to Adar, Inc. Battery condition indicator. 3,832,629, Cl. 324-29.500.

CFS Corporation: *See—*
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CGR Medical Corporation: *See—*
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Challenge-Cook Bros., Incorporated: *See—*
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Chamberlin, James W., to Lilly, Eli, and Company. Deshydroxymethyl derivatives of monensin. 3,832,358, Cl. 260-345.700.

Chambers, Harley Edward; and Hoagland, Richard E. Protective cap and fluid cylinder assembly. 3,831,802, Cl. 220-40.00r.

Champion Spark Plug Company: *See—*
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Chaney, Preston E. Dispenser for error correcting fluids. 3,832,071, Cl. 401-260.000.

Chang, Chen-Kuo, to Westinghouse Electric Corporation. Squirrel cage motor with improved rotor bar securing arrangement. 3,832,583, Cl. 310-201.000.

Chang, Wen-Hsuan; and Scriven, Roger L., to PPG Industries, Inc. Lactone reaction products. 3,832,333, Cl. 260-77.50c.

Chantereau, Robert, to Societe Anonyme dite; Societelorraine de Laminage Continu. Cleaning system for a high speed filter. 3,831,761, Cl. 210-274.000.

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Charpentier, Maurice, to Saint-Gobain Industries, mesne. Method and apparatus for the production of sheet on block of agglomerated granules of polystyrene. 3,832,429, Cl. 264-51.000.

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Chase-Shawmut Company, The: *See—*
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Chaska Chemical Company, Inc.: *See—*
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Chicago Fire Brick Company: *See—*
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Chisholm-Ryder Company, Inc.: *See—*
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Chlupsa, John Rudolph: *See—*
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Ciabrini, Jacques Paul Elie, to Ergins Matra. Fixing device for a component of a system. 3,832,040, Cl. 350-310.000.

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Cichy, Helen J. Stuffed doll and coin bank. 3,831,313, Cl. 46-2.000.

Cimarusti, Christopher M., to Squibb, E. R. & Sons, Inc. Process for preparing 21-chloro-17-acyloxy-20-ketosteroids. 3,832,366, Cl. 260-397.500.

Cimildora, Henry F.: *See—*
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Claasen, Antonius Bernardus. Safety closure. 3,831,796, Cl. 215-9.000.

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Clark, Donald E.: *See—*
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Clark, Harold A., to Dow Corning Corporation. Silicone elastomer containing polymonomethylsiloxane. 3,832,420, Cl. 260-825.000.

Clark, James M., to International Telephone and Telegraph Corporation. Digital speech detector. 3,832,493, Cl. 179-15.0as.

Clark, Russell D., Jr., to Westinghouse Electric Corporation. Prefabricated housing for electrical switchgear with external housing wall attachment means. 3,832,605, Cl. 317-120.000.

Clarke, Jesse E., to Autoquip Corporation. Platform system for servicing aircraft landing gear. 3,831,713, Cl. 187-8.410.

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Claypool, Harry W.: *See—*
Nugent, John L.; and Claypool, Harry W., 3,832,653.

Cleminson, Frederick Antony; and Ariss, Brian Arthur, to Triplex Safety Glass Company Limited. Windshield antenna. 3,832,714, Cl. 343-713.000.

Cleveland, Bruce B.; and Dougan, Thomas P., to Upjohn Company, The. Thermal insulating barrier of cellular polymer blocks. 3,832,263, Cl. 161-37.000.

Clingman, David R. Container support. 3,831,209, Cl. 9-1.00a.

Clorox Company, The: *See—*
Foley, Lary L., 3,831,205.

Coaxial Scientific Corporation: *See—*
McVoy, David S.; and Reynolds, Richard G., 3,832,690.

Coburn Optical Industries, Inc.: *See—*
Coburn, Orin W.; and Stith, Joe D., 3,831,236.

Coburn, Orin W.; and Stith, Joe D., to Coburn Optical Industries, Inc. Cup-shaped cutting tool having cutting teeth. 3,831,236, Cl. 29-103.00r.

Colado, Joseph J., to Superior Concrete Accessories, Inc. Articulated hold-down anchor device for the embedded cables of a prestressed concrete girder. 3,831,331, Cl. 52-225.000.

Cole, Andrew T.: *See—*
Brondy, Thomas L.; and Cole, Andrew T., 3,831,585.

Cole, Edward L.: *See—*
Hess, Howard V.; Cole, Edward L.; and Franz, William F., 3,832,279.

Cole National Corporation: *See—*
Richens, Robert H.; and Garner, Charles A., 3,831,488.

Coleman, Lloyd Archelle. Helmet guard. 3,831,407, Cl. 70-18.000.

Colgate-Palmolive Company: *See—*
Grand, Paul Sheldon, 3,832,310.

Collet, Clement Pierre. Processing apparatus. 3,831,509, Cl. 99-542.000.

Collins, Byron R.: *See—*
McVey, Charles I.; and Collins, Byron R., 3,832,588.

Colt Industries Operating Corporation: *See—*
Bell, Oliver A., Jr.; and Gilleland, Randall C., 3,832,511.

Colt, James G.; and Emus, Ronald W., Jr., to Carpetech Corporation. Carpet and upholstery cleaning apparatus with improved noise muffling feature. 3,831,223, Cl. 15-321.000.

Columbus Auto Parts Company, The: *See—*
Amos, James J., 3,831,244.
Amos, James J., 3,831,245.

Comer, Glen S., to Caterpillar Tractor Co. Single lever control for actuating multiple control valves. 3,831,633, Cl. 137-636.200.

Communications Satellite Corporation: *See—*
Sciulli, Joseph Albert; and Lutz, Paul Andrew, 3,832,491.

Compagnie Generale des Etablissements Michelin raison Sociale Michelin & Cie: *See—*
Boileau, Jacques, 3,831,654.
Dillenschneider, Jean Paul, 3,831,657.

Compagnie Industrielle des Communication Cit-Alcatel: *See—*
Leonard, Didier, 3,832,490.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Le Dily, Claude; and Lajotte, Dominique, 3,832,536.
Maurice, Louis, 3,832,084.

Compo Industries, Inc.: *See—*
Dunlap, Robert B.; and Balfour, Adrian E., 3,832,111.

Compoly, Albert William, to Avionic Instruments Inc. Parallel phase lock circuitry for inverters and the like. 3,832,622, Cl. 321-27.00r.

Compressive Industries, Inc.: *See—*
Andrews, Arthur J.; and Luther, Paul J., 3,831,499.

Compton, Carlton B.; and Doelp, Walter L, Jr., to Ford Motor Company. Breakerless ignition system. 3,831,570, Cl. 123-148.00e.

Conibear, David Eustace; and Halls, Maurice Vernon, to Sperry Rand Limited. Navigational apparatus. 3,831,286, Cl. 33-317.000.

Conklin, George W.: *See—*
Fetterly, Lloyd C.; Conklin, George W.; and May, Nathan C., 3,832,363.

Connolly, Peter F.: *See—*
Drozdowski, Robert J.; Connolly, Peter F.; Massaglia, Italo M.; and Chlupsa, John Rudolph, 3,832,135.

Conrad Industries Inc.: *See—*
Doumany, Constantine R., 3,831,624.

Conrad, Karl, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Take-off mechanism for sheet delivery apparatus used with a printing press. 3,831,932, Cl. 271-182.000.

Conrad, Rene, to Dynaloc Corporation. Method for making self-centering pulleys. 3,831,243, Cl. 29-148.40d.

Conroy, Richard F. M.: *See—*
Schmidt, Gerald W.; Smith, Jay III; Jones, Lawrence T.; and Conroy, Richard F. M., 3,831,552.

Consorti, Sebastian John. Laundry bag. 3,831,650, Cl. 150-7.000.

Continental Can Company, Inc.: *See—*
Hellmer, Ernest W., 3,831,929.

Continental Oil Company: *See—*
Hackett, Homer L.; and Starks, Charles M., 3,832,306.

Control Data Corporation: *See—*
Cray, Seymour R.; and Roush, Maurice D., 3,832,603.
Seim, Howard N.; and Roebke, Neal E., 3,832,494.

Cook, Charles A.; and Hajduk, Thaddeus J., to Zenith Radio Corporation. Method of lacquering cathode ray tube panels. 3,832,211, Cl. 117-33.50c.

Cook, Henry D., to K & M Enterprises, Incorporated. Spray bar with guide wheels and stabilizing poles. 3,831,848, Cl. 239-104.000.

Cook, John W. Toilet flush apparatus. 3,831,204, Cl. 4-57.00r.

Cook Machinery Company, Division of Wire Technology & Machinery Company: *See—*
Bravin, Ben, 3,831,412.

Cook, Russell P., to Polaroid Corporation. Underwater camera housing with means for manipulating a flash unit. 3,832,720, Cl. 354-64.000.

Cook, Russell P., to Polaroid Corporation. Underwater housing for enclosing photographic apparatus. 3,832,725, Cl. 354-64.000.

Cope, Geoffrey Wilton; and Smith, Loren William, to Dresser Industries, Inc. Railway car center bearing assembly. 3,831,530, Cl. 105-199.00c.

Coppersmith, Morris, to Packaging Aids, Inc. Dispensing system. 3,831,824, Cl. 222-525.000.

Coran, Aubert Yaucher; and Kerwood, Joseph Edward, to Monsanto Company. N-(thio)-glutarimides and N-(thio)-adipimides. 3,832,348, Cl. 260-239.30r.

Corcia, John T.: *See—*
Butler, Miles F.; and Corcia, John T., 3,832,195.

Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., to Monsanto Company. Process for the preparation of a poly(vinyl acetate dialkyl maleate acrylic acid) textile size. 3,832,321, Cl. 260-33.8ua.

Corning Glass Works: *See—*
Kapron, Felix P., 3,832,028.
McLean, Byron R., 3,831,580.

Cornish, Alan H.; Delaney, Ronald E.; and Davis, Robert B., to Koehler-Dayton, Inc. Sewage treatment system. 3,831,534, Cl. 110-8.00c.

Cornsweet, Tom N., to Acuity Systems, Incorporated. Apparatus and method for analyzing spherocylindrical optical systems. 3,832,066, Cl. 356-127.000.

Cosar Corporation: *See—*
Cox, James R., 3,832,070.

Coulson, Dale Robert, to Du Pont de Nemours, E. I., and Company. Amination of aromatic compounds in liquid hydrogen fluoride. 3,832,364, Cl. 260-378.000.

Cox, Arthur R.; and Holiday, Paul R., to United Aircraft Corporation. Apparatus for making articles from particulated matter. 3,832,107, Cl. 425-78.000.

Cox, James R., to Cosar Corporation. Calibration system for reflection densitometers. 3,832,070, Cl. 356-209.000.

Cox, Paul F., to Texas Instruments, Incorporated. Environment monitoring device and system. 3,831,432, Cl. 73-23.000.

CPC International, Inc.: *See—*
Milkovich, Ralph; and Chiang, Mutong T., 3,832,423.

Craig, Glenn D.: *See—*
La Haye, Paul G.; Craig, Glenn D.; and Turecek, Joseph L., 3,832,122.

Crane, Roy B., to Keene Corporation. Two circuit track lighting system. 3,832,503, Cl. 200-51.00r.

Crank, Gerald E., to Hole Pluggers, Inc. Hole plugging method. 3,831,383, Cl. 61-35.000.

Craven, Wilbur J., to Stanadyne, Inc. Enviromnent free snap hook. 3,831,229, Cl. 24-235.000.

Crawshaw, James R.: *See—*
Bernstein, Benjamin T.; Crawshaw, James R.; and McCurry, Morris H., 3,832,613.

Cray, Seymour R.; and Roush, Maurice D., to Control Data Corporation. Interconnect technique for stacked circuit boards. 3,832,603, Cl. 317-101.00d.

CRC-Crose International, Inc.: *See—*
Thigpen, James L., 3,831,684.

Crepaco, Inc.: *See—*
Wakeman, Alden H., 3,831,906.

Cressey, Philo Burton, Jr., to Scott Paper Company. Method of cast coating paper. 3,832,216, Cl. 117-64.00c.

Cretex Companies, Inc., The: *See—*
Longfellow, Richard C., 3,831,954.

Creusot-Loire: *See—*
Daniel, Edmond, 3,831,870.
Leroy, Pierre, 3,832,161.

Crisler, Larry R.; and Eggerman, William G., to United States of America, Atomic Energy Commission. Chemical Vapor deposition of uranium and plutonium. 3,832,222, Cl. 117-107.20r.

Critchley, John Phillip, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the. Aromatic fluoro-polyimides. 3,832,322, Cl. 260-37.00n.

Crockett, Joseph T.: *See—*
Hackbarth, Lowell E.; and Crockett, Joseph T., 3,832,327.

Cromie, Harry W., to Baxter Laboratories, Inc. Modular pneumatic surgical drill. 3,832,088, Cl. 415-199.00r.

Crompton & Knowles Corporation: *See*—
Wueger, Karl W., 3,831,640.

Cronk, Vern V.: *See*—
Ingram, Charles E.; Gendron, Roger J.; Cronk, Vern V.; and Keefe, Harry J., 3,831,293.

Crouch, Dell A., Jr. Purification of anhydrous aluminum chloride in situ in a salt melt. 3,832,452, Cl. 423-495.000.

Crucible Inc.: *See*—
Pinnow, Kenneth E.; Mehta, J. M.; and Moskowitz, A., 3,832,244.

Csicsery, Sigmund M., to Chevron Research Company. Single-stage cold start and evaporative control method and apparatus for carrying out same. 3,831,572, Cl. 123-179.00g.

CTS Corporation: *See*—
Holmes, Curtis L.; and Brady, Lynn J., 3,832,308.

Cubic Industrial Corporation, mesne: *See*—
Nelson, Alfred M.; McPherson, Robert G.; and Martin, Maurice s., 3,831,749.

Culbertson, Billy M.; Sedor, Edward A.; and McKillip, William J., to Ashland Oil, Inc. Process for shrinkproofing wool. 3,832,133, Cl. 8-127.600.

Cummins Engine Company, Inc.: *See*—
Perr, Julius P.; and Muntean, George L., 3,831,846.

Cummins, Millard M.; Keates, Richard H.; Best, Robert G.; and Barr, Donald L., to Thurman Manufacturing Company, The. String tension measuring device. 3,831,442, Cl. 73-144.000.

Currie, James H.: *See*—
Paxton, Wayne E.; Rishavy, Edward A.; and Currie, James H., 3,831,562.

Curtis, William I., to Hill Acme Company, The. Bar sorter. 3,831,779, Cl. 214-1.00p.

Curtiss, Alan C.: *See*—
Praglin, Julius; McKie, James E., Jr.; Curtiss, Alan C.; and Longhenry, David K., 3,832,532.

Cushing, Lloyd C. Apparatus for use in hauling traps and the like. 3,831,311, Cl. 43-6.500.

Cuthbert, Stanley G., to SCM Corporation. Brazing and solder compositions comprising a chelating agent. 3,832,242, Cl. 148-24.000.

Cutter Laboratories, Inc.: *See*—
Butler, William F., 3,831,814.

Cyprane Limited: *See*—
Needham, David Alan, 3,831,599.

Czich, Erhard: *See*—
Schmidt, Herbert; Weiler, Rolf; and Czich, Erhard, 3,831,634.

D & M Technologies, Inc.: *See*—
Hradcovsky, Rudolf J.; and Bayles, S. Heagan, Jr., 3,832,293.

Dachs, Norman W.: *See*—
Geering, Emil J.; and Dachs, Norman W., 3,832,329.

Dagon, Thomas J.: *See*—
Slovonsky, Idalee; Dagon, Thomas J.; and Bober, Thomas W', 3,832,453.

Dahlquist, Ralph L., to Applied Research Laboratories, Inc. Method of preparing analyte material for spectrochemcial analysis. 3,832,060, Cl. 356-36.000.

Dahm, Manfred: *See*—
Windemuth, Erwin; Dahm, Manfred; Richert, Karl Hartwig; and Maaben, Dieter, 3,832,311.

Daicel Ltd.: *See*—
Higuchi, Masaru; Yamada, Tadashi; and Suzuki, Ryoshu, 3,832,357.

Daimler Benz Aktiengesellschaft: *See*—
Gmeiner, Gunter; Kolle, Erwin; and Binder, Rudolf, 3,831,220.
Gmeiner, Gunter; Kolle, Erwin; and Binder, Rudolf, 3,831,221.

Daimler-Benz Aktiengesellschaft: *See*—
Allgaier, Rudolf; Brambilla, Luigi; and Scholz, Hans Jurgen, 3,831,972.
Lamm, Heinz, 3,832,104.
Mueller, Alf, 3,831,970.
Uhlenhaut, Rudolf; Rothweiler, Alfred; and Waxenberger, Erich, 3,831,967.
Zaiser, Wolfgang, 3,831,464.

Dallon, Dale S.; and Deseyn, Mary K., to Eastman Kodak Company. Photosensitive silver halide material containing a hydrophilic colloid hardened with a combination of formaldehyde and bis (vinylsulfonylmethyl) ether. 3,832,181, Cl. 96-67.000.

Dalton, William S.; and Umholtz, Franklyn G. Convertible swivel knife which illuminates work area. 3,831,276, Cl. 30-123.00r.

Daltronics International: *See*—
Dolan, Albert J., 3,831,812.

Daly, Charles Joseph: *See*—
Weber, Donald R.; Leaf, Harry Vincent; and Daly, Charles Joseph, 3,831,254.

Daly, William P.; and Pouliot, Oliver L., to Oneida Packaging Products, Inc. Spike-mounting stacked-bags process and apparatus. 3,831,504, Cl. 93-93.00m.

Damani, Nalinkant C., to ALZA Corporation. Auto inhaler. 3,831,606, Cl. 128-266.000.

Danberg, Victor. Solid waste trash grinder. 3,831,865, Cl. 241-32.000.

Daniel, Edmond, to Creusot-Loire. Device for winding flexible elements connected end-to-end by a joint. 3,831,870, Cl. 242-18.00a.

Dann, Murray: *See*—
Shu, Ping; and Dann, Murray, 3,832,462.

Darling, Dorothy E., to Universal Oil Products Company. Preparation of polynuclear aromatic hydrocarbons. 3,832,413, Cl. 260-673.000.

Dasgupta, Sumit; Richter, David H.; and Takayesu, Ted T., to International Business Machines Corporation. Data bus transmission line termination circuit. 3,832,575, Cl. 307-208.000.

Dauenhauer, William J.: *See*—
Gossett, Charles W.; and Dauenhauer, William J., 3,831,757.

Dauernheim, Hans; and Jander, Horst, to Golde, H. T., GmbH. Apparatus for connecting the guide tube of a cable window winder to a central guide rail. 3,831,320, Cl. 49-352.000.

Davenport, Larry C.: *See*—
Ellison, Donald E.; and Davenport, Larry C., 3,831,836.

Davies, Robert G.: *See*—
Neill, Henry R.; and Davies, Robert G., 3,832,531.

Davis, Dennis J.; and Juhasz, John E., to Bendix Corporation, The. Anti-skid control system for fluid pressure brakes. 3,832,013, Cl. 303-21.00p.

Davis, James W., to Addressograph-Multigraph Corporation. Single sheet document feeder. 3,831,928, Cl. 271-35.000.

Davis, John N., Sr. Ornament with securing means. 3,831,398, Cl. 63-2.000.

Davis, Robert B.: *See*—
Cornish, Alan H.; Delaney, Ronald E.; and Davis, Robert B., 3,831,534.

Dawdy, Jack A.: *See*—
Rutkowski, Edward J.; Dawdy, Jack A.; Hause, Robert F.; and Reinig, Irvine G., II, 3,831,334.

Dawidowitsch, Peter: *See*—
Geyken, Erwin; Schwarzmaier, Gerhard; and Dawidowitsch, Peter, 3,832,730.

Dayco Corparation: *See*—
Wagner, William T., 3,831,517.

de Niet, Edmond, to U.S. Philips Corporation. Method of converting image signals generated in a non-interlaced manner into image signals interlaced in accordance with a television standard. 3,832,487, Cl. 178-7.200.

De Nora, Oronzio: *See*—
Messner, George; De Nora, Oronzio; and De Nora, Vittorio, 3,832,300.

De Nora, Vittorio: *See*—
Messner, George; De Nora, Oronzio; and De Nora, Vittorio, 3,832,300.

De Paul, Alseno S., to Westinghouse Electric Corporation. Rotor for dynamoelectric machines. 3,832,584, Cl. 310-211.000.

De Staat der Nederlanden ten deze vertegenwoor digd door de Directeur-Generaal der Posterijen, Telegrafie & Telefonie: *See*—
Brok, Wilhelm Fredrik; Spanjersberg, Arie Adriaan; and Van Staveren, Joannes, 3,832,682.

De Vito, Louis, to Instrumentation Engineering, Inc. Digital word generating and receiving apparatus. 3,832,535, Cl. 235-153.0ac.

Deacon, John H. Airport runway construction. 3,831,889, Cl. 244-114.000.

Deaton, Clarence M.: *See*—
Deaton, James M.; and Deaton, Clarence M., 3,831,807.

Deaton, James M.; and Deaton, Clarence M., to Vendmart, Inc. Vending machine dispensing module tray. 3,831,807, Cl. 221-85.000.

Deepsea Ventures, Inc.: *See*—
Barton, Bruce E.; and Cardwell, Paul H., 3,832,295.
Kane, William S.; and Cardwell, Paul H., 3,832,165.

Deeran, Robert H., to Polaroid Corporation. Film loop control system for sound motion pictures. 3,832,044, Cl. 352-14.000.

Deere & Company: *See*—
Hansen, Harold Valentine, 3,831,867.

Deering, Raymond M.; and Pawlak, Raymond M., to Beckman Instruments, Inc. Surface electrode adapted for use with rheographic apparatus. 3,831,589, Cl. 128-2.10e.

DeFauw, Raymond Henry; and Murley, Raymond G., to Ford Motor Company. Automotive fan shroud. 3,832,085, Cl. 415-119.000.

Degremont, Societe Generale d'Epuration et d'Assainissement: *See*—
Savall, Vincent; Treille, Pierre; and Bouchard, Jean, 3,831,750.

Degremont Societe Generale d'Epuration et de Assainissement: *See*—
Lefur, Jean; Louboutin, Robert; and Savall, Vincent, 3,831,767.

Degroote, Raymond S., to United Aircraft Products, Inc. Method of metallurgically bonding an internally finned heat exchange structure. 3,831,247, Cl. 29-157.30a.

Deguchi, Hidetaka: *See*—
Inoue, Isaburo; Hanzawa, Teruo; Endo, Takaya; and Deguchi, Hidetaka, 3,832,386.

Dehar, David C., to Ford Motor Company. Linkage quick-connect device. 3,832,074, Cl. 403-163.000.

Del Mar, Bruce E., to Del Mar Engineering Laboratories. Portable exercise machine. 3,831,942, Cl. 272-73.000.

Del Mar Engineering Laboratories: *See*—
Del Mar, Bruce E., 3,831,942.
Syrop, Leroy J., 3,832,142.

Delaney, Ronald E.: *See*—
Cornish, Alan H.; Delaney, Ronald E.; and Davis, Robert B., 3,831,534.

Delattre-Levivier: *See*—
Dorville, Robert, 3,831,911.

Delorme, Pierre Claude Marcel, to Pont-A-Mousson S.A. Porous die plate extruder. 3,832,116, Cl. 425-381.200.

Demoute, Jean-Peirre: *See*—
Hainaut, Daniel; Toromanoff, Edmond; and Demoute, Jean-Peirre, 3,832,353.

Denalsky, Donna. Educational board game apparatus. 3,831,946, Cl. 273-134.0ad.

Dennis, Richard Benson: *See—*
Smith, Stanley Desmond; Wood, Roland Andrew; and Dennis, Richard Benson, 3,832,061.

Dennison Manufacturing Company: *See—*
Joyce, Arthur W., 3,831,737.

Denommee, Maurice R., to United States of America, Army. Ballistic armor of plies of nylon fabric and plies of glass fabric. 3,832,265, Cl. 161-92.000.

Denton, William I.: *See—*
Hammond, Philip D.; Clarke, William M.; and Denton, William I., 3,832,372.

DePas, Laddie A., to General Electric Company. Condenser apparatus. 3,831,292, Cl. 34-75.000.

Derbyshire, Alfred; Ivins, Kenneth William; and Whetton, Edward Thomas, to Wellman Incandescent Furnace Company Limited. Coil annealing furnaces. 3,832,129, Cl. 432-77.000.

Descary, John Gilbert: *See—*
Bartley, Thomas S.; Descary, John Gilbert; Futcher, R. James; and Krishnan, R. Gopala, 3,832,283.

Deschamps, Andre: *See—*
Renault, Phillippe; Deschamps, Andre; and Dezael, Claude, 3,832,454.

Deschamps, Joseph P., to International Harvester Company. Independent power take off clutch brake. 3,831,722, Cl. 192-18.00r.

Deschenes, Roger, to Wabco Westinghouse. Variable load brake apparatus. 3,832,014, Cl. 303-22.00r.

Deseyn, Mary K.: *See—*
Dallon, Dale S.; and Deseyn, Mary K., 3,832,181.

Design Properties, Inc.: *See—*
Foley, Dennis J.; and Gilmore, Richard A., 3,832,679.

Detemple, Manfred F.; Hubner, Horst; and Oswald, Johann. Electrode comprising a head and a detachable plug. 3,832,675, Cl. 339-143.00r.

Deutsche Bendix Aurustungs GmbH: *See—*
Thomas, Alfred William, 3,831,491.

Deutscher, Hans-Christian; and Bauer, Kurt, to SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH. Windscreen wiper. 3,831,219, Cl. 15-250.210.

Device Research Inc.: *See—*
Rindner, Wilhelm, 3,831,588.

Devlin, Shaun S.: *See—*
Cederquist, Alf L.; and Devlin, Shaun S., 3,832,640.

Dewhurst & Partner Limited: *See—*
Dewhurst, Alan, 3,832,506.

Dewhurst, Alan, to Dewhurst & Partner Limited. Illuminated push button switch. 3,832,506, Cl. 200-314.000.

Dezael, Claude: *See—*
Renault, Phillippe; Deschamps, Andre; and Dezael, Claude, 3,832,454.

Di Palma, Giorgio; and Gajewski, Henry M., to Baxter Laboratories, Inc. Method of making an inflatable balloon catheter. 3,832,253, Cl. 156-86.000.

Diagnostic Data, Inc.: *See—*
Huber, Wolfgang; and Schulte, Thomas L., 3,832,338.

Diamond Shamrock Corporation: *See—*
Ferretti, Emmett J., 3,831,347.

Diamonhead Corporation: *See—*
Gottlieb, C. Robert; and Lewis, Eugene C., 3,831,770.

Diaz, Ricardo A.: *See—*
Szabo, Andras I.; and Diaz, Ricardo A., 3,832,646.

Dickens, Charles V. Vehicle suspension system. 3,831,965, Cl. 280-96.20r.

Dickson Paper Fibre, Inc., mesne: *See—*
Berkowitz, Lawrence; Novickis, Georgs; and Sheth, Prafulchandra N., 3,831,748.

Didier-Werke A.G.: *See—*
Kutzer, Hans-Joachim; Strohmeier, Gerolf; Natter, Bernd; and Sedlatschek, Karl, 3,831,825.

Diemer, Bodo. Frame to assemble after unitized construction. 3,831,336, Cl. 52-648.000.

Dietz, Wolfgang Friedrich Wilhelm, to RCA Corporation. Horizontal deflection system with boosted B plus. 3,832,595, Cl. 315-27.0td.

Dietzel, Kenneth H.: *See—*
Skarin, Carl R.; Dietzel, Kenneth H.; and Gendron, Roger J., 3,831,780.

Digital Equipment Corporation: *See—*
Krishna, Raliapalli, 3,832,489.

Dillenburg, Helmut; Honig, Helmut; and Siegel, Rudolf, to Kali-Chemie Aktiengesellschaft. Method for producing sodium perborate trihydrate. 3,832,447, Cl. 423-281.000.

Dillenschneider, Jean Paul, to Compagnie Generale des Etablissements Michelin raison Sociale Michelin & Cie. Tire having folded tread-reinforcement ply with cord in each fold. 3,831,657, Cl. 152-361.0fp.

Ditcher, John, to A-LOK Corporation. Method of providing a gasket seal between sewer pipe and manhole opening. 3,832,438, Cl. 264-274.000.

Dixon, David Rodney; Rose, John Brewster; and Turton, Cecil Nigel, to Imperial Chemical Industries, Limited. Polymerization of tetracarboxylic acid derivatives and urea or urethane derivatives of diamines. 3,832,330, Cl. 260-47.0cp.

Dixon, Richard Hill: *See—*
McCrillis, Raymond Lee; Dixon, Richard Hill; and Oldani, John Francis, 3,831,327.

Dobedoe, Thomas J. L.: *See—*
Brittain, William J.; Dobedoe, Thomas J. L.; Mitchell, Raymond; and Oliver, Wilfred T., 3,831,563.

Dobis, Emilia: *See—*
Mlinko, Sandor; Banfi, Dezso; Dobis, Emilia; Ottinger, Jozsef; Payer, Karoly; Palagyi, Tivadar; and Turi, Agnes, 3,832,137.

Dobrosielski, Stephen S.: *See—*
Cellerini, Albert R.; and Dobrosielski, Stephen S., 3,832,504.

Dockery, Benjamin F.; and Mason, Jack H. Apparatus for preparing furniture backs and cushions for tufting. 3,832,083, Cl. 408-24.000.

Doelp, Walter L, Jr.: *See—*
Compton, Carlton B.; and Doelp, Walter L, Jr., 3,831,570.

Doig, Stuart H. Candle mold with resilient wick holder. 3,831,899, Cl. 249-97.000.

Dolan, Albert J., to Daltronics International. Fluid dispensing system. 3,831,812, Cl. 222-20.000.

Dominici, Antonio, to Quepor S.A. Device for automatically finishing and grouping packaging containers. 3,831,343, Cl. 53-61.000.

Dominion Bridge Company Limited: *See—*
Leese, Gerald H.; and Kennedy, David H., 3,831,419.

Domtar Limited: *See—*
Flynn, Robert E.; and Price, Gordon L., 3,831,765.

Donahue, Edward T.: *See—*
Kenney, Harold E.; Donahue, Edward T.; and Maerker, Gerhard, 3,832,368.

Donaldson, Coleman Dup; and Snedeker, Richard S., to Aeronautical Research Associates of Princeton, Incorporated. Self-regulating thermal protection system for heated surfaces. 3,831,396, Cl. 62-467.000.

Donermeyer, Donald D.: *See—*
Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., 3,832,321.

Donkersloot, Hendrik Cornelis; and Van Vucht, Johannes Hendrikus Nicolaas, to U.S. Philips Corporation. Shape memory elements. 3,832,243, Cl. 148-32.000.

Doolittle, Milton A., to Select-A-Size, Ltd. Mirror having variable convex lower portion. 3,832,039, Cl. 350-295.000.

Dopera, Edgar E. Stringed musical instrument with removable neck. 3,831,485, Cl. 84-275.000.

Dorville, Robert, to Delattre-Levivier. Apparatus for the agglomeration of ore. 3,831,911, Cl. 266-21.000.

Dougan, Thomas P.: *See—*
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Douglas, David Ramsey. Photographic material. 3,832,180, Cl. 96-66.300.

Douglas, Lawrence M., to Polaroid Corporation. Apparatus and system for flash photography. 3,832,722, Cl. 354-29.000.

Doumany, Constantine R., to Conrad Industries Inc. Plumbing outlet box. 3,831,624, Cl. 137-360.000.

Dover Corporation: *See—*
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Dover Corporation (De-Sta-Co. Division): *See—*
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Saunders, Frederick Charles; and Smith, Charles, 3,832,203.

Downey, Bruce R.; and Irvine, Douglas S., to American Home Products Corporation. Estrus and ovulation regulation. 3,832,469, Cl. 424-318.000.

Doyen, Louis, to Thir onnier & Cie. Metering dispenser for a flowable material. 3,831,821, Cl. 222-255.000.

Doyle, William L., to TRW Inc. Recovery of SO2 and SO3 from flue gases. 3,832,444, Cl. 423-242.000.

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Dransch, Gunter: *See—*
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Draper, Robert; Beecher, Donald T.; and Ayers, David L., to Westinghouse Electric Corporation. Range exterior surface cooling device. 3,831,578, Cl. 126-19.00r.

Draxler, Walter E., to Golconda Corporation. Micro torch. 3,831,631, Cl. 137-606.000.

Drayton, Walker E.; and Krout, Elwood L., to American Chain & Cable Company, Inc. Spreader beam fitting. 3,831,993, Cl. 294-81.00r.

Dreisewerd, Douglas W.: *See—*
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Pavlica, Stanley Ronald; and Weaver, Ernest Paul, 3,832,194.

Dressler, Thomas C.; and Arnold, Thomas J. Dispensing carton 229/017.00m. 3,831,833, Cl. .

Driver, Wilbur B., Company: *See—*
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Droege, Arthur J. Pest control device. 3,831,548, Cl. 116-22.00a.

Drori, Mordeki. Rotary sprinklers. 3,831,853, Cl. 239-230.000.

Drozdowski, Robert J.; Connolly, Peter F.; Massaglia, Italo M.; and Chlupsa, John Rudolph, to Becton, Dickinson and Company. Automatic clinical analyzer. 3,832,135, Cl. 23-230.00r.

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Du Pont de Nemours, E. I., and Company: *See—*
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Dubovsky, Boris Grigorievich; Bogatyrev, Viktor Konstantinovich; Vladykov, German Matveevich; and Sviridenko, Valentina Yakovlevna. Apparatus for storing and processing fissionable substances. 3,832,563, Cl. 250-506.000.
DuBrow, Paul L.; and Frisque, Alvin J., to Nalco Chemical Company. Method of using latex polymer formulations for seepage control. 3,832,229, Cl. 117-161.0va.
Dudko, Danill Andreevich; Sur, Mikhail Danilovich; and Asoyants, Grigory Bagradovich. Epicyclic hydropheumatic drive with internal-mesh gearing. 3,832,098, Cl. 418-63.000.
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Dumont, Jacques, to Kuhn S.A. Fertilizer distributor. 3,831,818, Cl. 222-145.000.
Duncan, Alex R., to Molson Companies Limited, The. Uncaser cup. 3,831,995, Cl. 294-90.000.
Duncan, Robert; and Cellier, Francis, to Westinghouse Electric Corporation. Nuclear reactor fuel rod splitter. 3,831,248, Cl. 29-200.00d.
Dunder, David; and Wiley, Sheldon, to Trans World Products, Inc. Drive transmission for a bicycle or the like. 3,831,978, Cl. 280-238.000.
Dunlap, Robert B.; and Balfour, Adrian E., to Compo Industries, Inc. Apparatus for making component parts of shoes and the like comprised of thermoplastic sheeting. 3,832,111, Cl. 425-174.200.
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Duschinsky, Robert, to Hoffmann-La Roche Inc. Purine nucleoside nitrates. 3,832,341, Cl. 260-211.50r.
Duval, Mark, to Sanitank Inc. Video photo recording device for the inspection of the interior of pipes. 3,832,724, Cl. 354-63.000.
Dye, Homer S., to Pacific Clay Products. Apparatus for making ceramic shingles from extruded hollow blocks of soft clay. 3,832,112, Cl. 425-291.000.
Dye, John F., to Kendall Company, The. Apparatus for measuring average flow rate. 3,831,446, Cl. 73-194.00r.
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Voglesonger, Harry M., 3,831,278.
Dzierski, Stanley F., to Aluminum Company of America. Method of soldering. 3,831,263, Cl. 29-503.000.
Earl, Arthur W. Self adjustable ski binding. 3,831,956, Cl. 280-11.35d.
Easterly, Donald O., to Eastman Kodak Company. Reel driving device for a web transporting apparatus. 3,831,883, Cl. 242-207.000.
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Ecodyne Corporation: *See—*
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Economy, James; and Lin, Ruey Y., to Carborundum Company, The. Activated carbon chemical absorption assembly. 3,831,760, Cl. 210-242.000.
Edelman, Alfred E. Method and apparatus for tooth restoration. 3,831,281, Cl. 32-2.000.
Edens, Charles O., to Eastman Kodak Company. Inhibition of fog in photographic color development. 3,832,179, Cl. 96-56.000.
Edmonds, Harold D., to International Business Machines Corporation. Liquid crystal display assembly. 3,832,034, Cl. 350-160.01c.
Edmunds, George W.: *See—*
Hoppmann, Kurt H.; Edmunds, George W.; and Schober, Horst A., 3,831,734.
Edmunds, Louis Henry, Jr.; and Braley, Silas A., to University of California, The Regents of the. Implantable bulb for inflation of surgical implements. 3,831,583, Cl. 128-1.00r.
Edwards, Arnold Glen; and Jenkins, Charles J., to Halliburton Company. Pressure responsive auxiliary disc valve and the like for well cleaning, testing and other operations. 3,831,680, Cl. 166-311.000.
Eggensperger, Heinz; Franzen, Volker; Muller, Horst; and Stephan, Hans, to Ciba-Geigy AG. Organic compositions stabilized with phenolic thiocarboxylic acid esters. 3,832,328, Cl. 260-45.85b.
Eggerman, William G.: *See—*
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Eggert, Walter S., Jr.; and Pavlik, Michael J., to Budd Company, The. Automotive restraint system. 3,832,002, Cl. 297-216.000.
Eichler, Norbert; and Urban, Kurt, to Gebr. Bohler & Co., Aktiengesellschaft. Apparatus for cutting of fiber strands. 3,831,482, Cl. 83-675.000.
Eickmann, Kearl. Pressure responsive control body arrangement. 3,831,496, Cl. 91-487.000.
Eisenberg, Robert, to Singer Company, The. Loran signal synthesizer. 3,832,708, Cl. 340-352.000.
Ekemar, Carl Sven Gustaf, to Sandco Limited, mesne. Method of coating sintered hard metal bodies and hard metal body coated according to the method. 3,832,221, Cl. 117-106.00c.
Elbert, Raymond J.; and Farrier, Ernest G., to Union Carbide Corporation. Reinforced porous metal structure and manufacture thereof. 3,831,258, Cl. 29-420.000.
Elder, Fred Grove: *See—*
Brey, Wilhelm; Hostetler, William; Loeffler, Earl Ferdnand; Kolm, Hubert Ernest; and Elder, Fred Grove, 3,832,261.
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Eldridge, Colin C.: *See—*
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Electric Corporation: *See—*
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Elementos Para Traccion y Excavaction, S.A.: *See—*
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Elesh, James N. Cat litter box. 3,831,557, Cl. 119-1.000.
Elkem A/S: *See—*
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Eller, Dennis E. Truck tire spare carrier. 3,831,793, Cl. 214-454.000.
Ellison, Donald E.; and Davenport, Larry C., to Inland Container Corporation. Container having corner post holders. 3,831,836, Cl. 229-49.000.
Ellithorpe, Ernest Ralph; and Fletcher, Ronald Bruce, to Vennard & Ellithorpe Ltd. Method and apparatus for the solidification of molten sulphur. 3,832,145, Cl. 23-293.00s.
Elmore, J. Russell; and Benson, Carl F., to Torrington Company, The. Radial and thrust bearing and method of making same. 3,831,241, Cl. 29-148.40r.
Elward, John R., to Fibreboard Corporation. End opening container with improved stacking strength. 3,831,834, Cl. 229-23.00r.
Emerson, Robert B., to Kaiser Aluminum & Chemical Corporation. Method for producing alumina hydrates. 3,832,442, Cl. 423-111.000.
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Endres, Leland S.; Gehlhoff, Leo F.; and Zimmerman, Dallas D. Aldehyde condensation products of fluoroaliphatic phenols. 3,832,409, Cl. 260-619.00a.

Energy Sciences Incorporated: *See—*
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Engelhard, Dieter; Hofmann, Hermann; Schaff, Ulrich; and Kaiser, Walter, to Siemens Aktiengesellschaft. Print for control modules of contact-free control and regulating systems. 3,832,602, Cl. 317-101.00r.

Engelhardt, Bjorn H.: *See—*
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Engeli, Federico, to Technical Arco Establishment. Mechanical-pyric device utilizable in the type of anti-man mines with a wide action range and gushing out from the ground. 3,831,521, Cl. 102-8.000.

Epps, William A.: *See—*
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Erk, Kaya: *See—*
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Erlichman, Irving, to Polaroid Corporation. Lockout mechanism for automatic trim assembly return mechanism. 3,832,721, Cl. 354-21.000.

Erlinder, Atwood E. Lift having self-folding platform. 3,831,788, Cl. 214-75.00t.

Eschen, Franklin W., to Johns-Manville Corporation. Wear resistant composition brake block. 3,832,325, Cl. 260-38.000.

Esso Production Research Company: *See—*
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Eto, Yoshizumi; and Kanazawa, Yasunori, to Hitachi, Ltd. Image pickup tube for converting coherent light images into electrical signals. 3,832,585, Cl. 313-371.000.

Ettel, Hubert, to Mende, Wilhelm & Co. Apparatus for compressing chipboards. 3,832,115, Cl. 425-373.000.

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Sutton, William Heald; Evans, Thomas Ernest; and Hart, Anthony Christopher, 3,832,292.

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Excoffon, Jean, to Automobiles M. Berliet. Cylinder head for an internal combustion engine. 3,831,573, Cl. 123-193.00h.

Expert Automation, Inc.: *See—*
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Fabrique Nationale Herstal S.A. en abrege FN: *See—*
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Factory Mutual Research Corporation: *See—*
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Livingston, William L., 3,831,681.

Fahey, Wm. David; and Johnson, Robert W., to Singer Company, The. Non-impact printer. 3,832,488, Cl. 178-15.000.

Fail Safe Brake Corporation: *See—*
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Fontaine, John G., 3,831,703.

Fairbank, Winthrop H., to Northrop Corporation. Ball-bearing retainers. 3,832,023, Cl. 308-201.000.

Fairchild Industries, Inc.: *See—*
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Falk, Morris, to Fort Lock Corporation. Tubular key decoder. 3,831,282, Cl. 33-169.00b.

Fantl, Joel: *See—*
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Faris, Edwin E.; and Hertling, Charles J., to Berkey Photo, Inc. Camera accommodating two sizes of films. 3,832,728, Cl. 354-210.000.

Farona, Michael F.; and White, James F., to University of Akron, The. Method for reacting organic halides. 3,832,403, Cl. 260-592.000.

Farr Company: *See—*
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Farrier, Ernest G.: *See—*
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Farris, Edward. Boat loading and unloading kit. 3,831,790, Cl. 214-83.240.

Faucheux, Pierre, to Etablissement Fresa Vaduz. Composite slide rule. 3,831,840, Cl. 235-89.00r.

Fearing, Ralph: *See—*
Weil, Edward D.; and Fearing, Ralph, 3,832,227.

Featherman, Bernard. Electrical locker means. 3,831,408, Cl. 70-84.000.

Feichtner, John D., to Westinghouse Electric Corporation. Fluidally controlled dye laser. 3,832,649, Cl. 331-94.501.

Feldman, Nicholas, to Esso Research and Engineering Company. Fuel oil with improved low temperature flowability. 3,832,150, Cl. 44-62.000.

Felix, Gerardus L.: *See—*
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Kovacs, Sandor; and Felsovalyi, Gyorgy, 3,831,433.

Fenne, Ivor; and C.A.V. Limited. Fuel injection nozzles. 3,831,863, Cl. 239-533.000.

Fern, Robert E.; and Onton, Aare, to International Business Machines Corporation. Automatic wavelength tracking system. 3,832,558, Cl. 250-461.000.

Ferretti, Emmett J., to Diamond Shamrock Corporation. Process for scrubbing a reaction by-product vapor. 3,831,347, Cl. 55-48.000.

Ferro Corporation: *See—*
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Fetterly, Llyod C.; Conklin, George W.; and May, Nathan C., to Shell Oil Company. Method of epoxidizing olefinic compounds using an oxyboron catalyst. 3,832,363, Cl. 260-348.50v.

Fey, Maurice G.: *See—*
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Fiber Industries, Inc.: *See—*
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Fibreboard Corporation: *See—*
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Finelli, Patrick L., to Polaroid Corporation. Collapsible camera. 3,832,726, Cl. 354-187.000.

Finger, Rudolph; Berg, Erich; and Schuppstuhl, Heinz, to Ohler Eisenwerk Theob. Pfeiffer. Cover with opening tab for containers, in particular eating bowls. 3,831,837, Cl. 229-51.0ts.

Firestone, Raymond A.: *See—*
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Firestone Tire & Rubber Company, The: *See—*
Brey, Wilhelm; Hostetler, William; Loeffler, Earl Ferdnand; Kolm, Hubert Ernest; and Elder, Fred Grove, 3,832,261.

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Fischer, Edward L., to Indiana National Bank, The. Mail order sales device method. 3,831,519, Cl. 101-426.000.

Fisher, Don E.; Knauff, Paul A.; and Bowen, David, Jr., to Monsanto Company. Traverse winding apparatus. 3,831,872, Cl. 242-43.000.

Fisher, John A.: *See—*
Saddler, Ivan R.; and Fisher, John A., 3,832,247.

Fitch, Otis. Electric grain gate control. 3,832,615, Cl. 318-481.000.

Fitterer, Horst; and Schaeffer, Norbert. Guide means for magnetic tapes wound on flangeless spools. 3,831,882, Cl. 242-199.000.

Fitzgerald, Maurice J., to Polaroid Corporation. Synthetic silver halide emulsion binder. 3,832,185, Cl. 96-114.000.

Fives Lille-Cail: *See—*
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Flaherty, Bernard M., to Ford Motor Company. Motor vehicle disc brake having caliper retaining means. 3,831,717, Cl. 188-73.300.

Fleissner, Hans, to Vepa AG. Device for cutting endless material, for example for the production of staples from synthetic fibers. 3,831,473, Cl. 83-100.000.

Fleissner, Heinz, to Vepa Aktiengesellschaft. Godet for use in drawing apparatus and drum dryer units. 3,831,666, Cl. 165-89.000.

Fletcher, Gerald M.: *See—*
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Childress, Lloyd K., Jr.; Flippen, George B., Jr.; and McDaniels, Louis M., 3,832,734.

Flippen, George Burdine, Jr.; and Ward, John Wesley, Jr., to International Business Machines Corporation. Data web guiding apparatus. 3,831,831, Cl. 226-198.000.

Flood, Hakon; and Seltveit, Arne, to Elkem A/S. Method of treating silicon dioxide dust. 3,832,434, Cl. 264-117.000.

Florian, Eugene F., to Mark Products, Inc. Electrical connector. 3,832,674, Cl. 339-60.00r.

Flynn, Robert E.; and Price, Gordon L., to Domtar Limited. Filter frame. 3,831,765, Cl. 210-484.000.

Flynt, Frank V., to General Electric Company. Pumped air storage peaking power system using a single shaft gas turbine-generator unit. 3,831,373, Cl. 60-39.330.

FMC Corporation: *See—*

Smith, Frederick R.; and Schappel, Joseph W., 3,832,277.
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Focht, John Richard, to Precision Valve Corporation. Aerosol safety cap. 3,831,804, Cl. 220-60.00r.

Focht, John Richard, to Precision Valve Corporation. Childproof safety cap for a pressurized dispenser. 3,831,820, Cl. 222-182.000.

Foley, Dennis J.; and Gilmore, Richard A., to Design Properties, Inc. Highway emergency communications-warning system and units. 3,832,679, Cl. 340-22.000.

Foley, Lary L., to Clorox Company, The. Automatic dispensing apparatus. 3,831,205, Cl. 4-228.000.

Fontaine, John G., to Fail Safe Brake Corporation. Motor vehicle brake system. 3,831,698, Cl. 180-77.00r.

Fontaine, John G., to Fail Safe Brake Corporation. Automatic parking or emergency brake system for motor vehicles. 3,831,703, Cl. 180-82.00r.

Fontana, Frank J., to Stewart-Warner Corporation. Trash can dolly. 3,831,959, Cl. 280-79.100.

Forand, James L., Jr.; and Township, Pa., to Bethlehem Steel Corporation. Composite article comprising three dissimilar metals. 3,832,147, Cl. 29-191.000.

Forbes, Alden O., to North 40 Manufacturing Inc. Water fountain for animals. 3,831,558, Cl. 119-73.000.

Ford Motor Company: *See—*
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Brittain, William J.; Dobedoe, Thomas J. L.; Mitchell, Raymond; and Oliver, Wilfred T., 3,831,563.
Cederquist, Alf L.; and Devlin, Shaun S., 3,832,640.
Compton, Carlton B.; and Doelp, Walter L, Jr., 3,831,570.
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Freismuth, Richard J., to Ford Motor Company. Carburetor choke altitude compensation. 3,831,909, Cl. 261-39.00a.

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Grewer, Rudolf; Hickmann, Herbert; and Trecker, Hermann, to Thyssen Niederrhein AG, Hutten- & Walzwerke. Discharge device for direct-reduction shaft furnace. 3,831,787, Cl. 214-23.000.
Grieger, Gerhard; and Bohrdt, Joaquin, to Siemens Aktiengesellschaft. Electric circuit breaker with hydraulic actuating means including a plurality of valves for opening the breaker, and a plurality of valves for closing the breaker. 3,832,502, Cl. 200-82.0b.
Griesenbrock, Karl-Heinz, to Eaton Corporation. Material handling apparatus. 3,831,786, Cl. 214-16.40a.
Griffin, Henry W., to General Motors Corporation. Restraint belt retractor. 3,831,878, Cl. 424-107.400.
Griffin, Richard H., to International Telephone and Telegraph Corporation. Electric fuse. 3,832,666, Cl. 337-272.000.
Grinshpon, Semen Yakovlevich: *See—*
Medovar, Boris Izrailevich; Lanevsky, Valery Evgenievich; Alferov, Jury Fedorovich; Dubinsky, Rudolf Solomonovich; Berezovsky, Mikhail Elevich; Chekotilo, Leonty Vasilievich; Pavlov, Leonid Viktorovich; Ishunkin, Veniamin Alexandrovich; Shevtsov, Anatoly Ianovich; and Grinshpon, Semen Yakovlevich, 3,832,476.
Groepper, Jurgen; and Sanchez, Jose, to Pennwalt Corporation. Curing and polymerizing processes employing beta-substituted diperoxyketals. 3,832,336, Cl. 260-89.100.
Gross, Franz, to Siemens Aktiengesellschaft. Selectively damped travelling wave tube. 3,832,593, Cl. 315-3.500.
Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Automobile suspensions. 3,831,966, Cl. 280-124.00b.
Grosseau, Albert, to S. A. Automobiles Citroen. Brake control devices for preventing locking a braked wheel. 3,832,010, Cl. 303-21.0eb.
Grosser, Christian E.: *See—*
Kline, Robert H.; and Grosser, Christian E., 3,831,838.
Grosvenor, Clifford Ray; Resch, Ronald R.; and Pumm, Paul P., to Singer Company, The. Cascaded variable delay system. 3,832,571, Cl. 307-154.000.
Grundy, Reed H., to Westinghouse Air Brake Company. Vital more restrictive speed command sensing circuit. 3,832,599, Cl. 317-5.000.
Gsell, Hans Peter; and Kunzler, Friedrich, to Tirama AG. Spray installation for highly-filled dispersions. 3,831,851, Cl. 239-175.000.
GTE Automatic Electric Laboratories Incorporated: *See—*
Vrba, James J., 3,832,496.
GTE Sylvania Incorporated: *See—*
Bunker, Thomas D., 3,832,480.
Hay, Warren H., 3,832,257.
McDonough, Thomas P.; and Shaffer, John W., 3,832,125.
Szeverenyi, Nikolaus A., 3,832,702.
Waymouth, John F.; Koury, Frederic; and Gungle, Warren Calvin, 3,832,587.
Guerci, Carlo: *See—*
Pagella, Elio; and Guerci, Carlo, 3,831,283.
Guhl, Horst, to Thimm Wellpappen K. G., Firma. Packing case for reception of tetra-hedron-shaped individual packings and an apparatus for piling up the individual packings in the packing case. 3,831,835, Cl. 229-37.00r.
Gulf Research & Development Company: *See—*
Bercik, Paul G.; and Henke, Alfred M., 3,832,418.
Gaylord, Eber W.; Goodwin, Robert J.; and Mori, Ernest A., 3,831,753.
Gulla, Michael, to Shipley Company, Inc. Metal finishing alloy of nickel-copper-phosphorus. 3,832,168, Cl. 75-170.000.

Gullaksen, Gilbert V.; and Jatho, George W., to Wrightway Mfg. Co. Low flow volume shower head. 3,831,860, Cl. 239-500.000.

Gungle, Warren Calvin: *See—*
Waymouth, John F.; Koury, Frederic; and Gungle, Warren Calvin, 3,832,587.

Gunsalus, Claude A. Mounting apparatus for indexable cutting inserts. 3,831,237, Cl. 29-105.00r.

Guntermann, Hans, to Elektro-Thermit GmbH. Closure for crucibles used for aluminothermic reactions. 3,831,915, Cl. 266-34.00r.

Gupner, Otto: *See—*
Gilles, Helmut; Gupner, Otto; and Haselmayer, Karl, 3,831,350.

Gurien, Harvey; Rachlin, Israel; and Teitel, Sidney, to Hoffman-La Roche Inc. Process for substituted sulfonylureas. 3,832,397, Cl. 260-553.00d.

Gurzenda, Vernon W. Door stop. 3,831,989, Cl. 292-338.000.

Gusovius, Eckart, to Duplomat, Boger, Dr., Apparate KG, Firm, The. Process and apparatus for setting a reproduction camera. 3,832,058, Cl. 355-56.000.

Guthrie Industries Limited: *See—*
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Gyogyszerkutato Intezet: *See—*
Mlinko, Sandor; Banfi, Dezso; Dobis, Emilia; Ottinger, Jozsef; Payer, Karoly; Palagyi, Tivadar; and Turi, Agnes, 3,832,137.

Gysell, Bjorn; Nilsson, Karl Axel; and Nilvid, Gary. Fire alarm system. 3,832,678, Cl. 340-22.00r.

Gyugyi, Laszlo, to Westinghouse Electric Corporation. Electrical power generating arrangement and method utilizing an induction generator. 3,832,625, Cl. 322-47.000.

Haake, Robert, to Bell & Howell Company. Sequential picture apparatus with oscillatory optical compensator. 3,832,047, Cl. 352-109.000.

Hackbarth, Lowell E.; and Crockett, Joseph T., to Huber, J. M., Corporation. Alkali metal alumino silicates, methods for their production and compositions thereof. 3,832,327, Cl. 260-42.370.

Hackett, Homer L.; and Starks, Charles M., to Continental Oil Company. Process for the preparation of active carbon from halohydrocarbons. 3,832,306, Cl. 252-422.000.

Hadad, Joseph D.: *See—*
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Haemonetics Corporation: *See—*
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Hafner, Robert O.; and Anderson, Richard M., to Heil Quaker Corporation. Air conditioner with air flow sensor. 3,831,392, Cl. 62-140.000.

Hageman, Howard A., to Uniroyal, Inc. Alpha-(Chlorothio)isobutyronitrile, alpha-chloro-dithio)isobutyronitrile and their preparation; and preparation of alpha, alpha-dithiobisisobutyronitrile. 3,832,378, Cl. 260-465.100.

Hagiwara, Kokichi: *See—*
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Hagle, Edward E. Alphanumeric tactile information communication system. 3,831,296, Cl. 35-35.00a.

Hainaut, Daniel; Toromanoff, Edmond; and Demoute, Jean-Peirre, to Roussel-UCLAF. 2H-thiapyrans. 3,832,353, Cl. 260-327.0th.

Hajduk, Thaddeus J.: *See—*
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Hakes, Paul E.: *See—*
Trabbic, Gerald W.; Dunn, Wayne C.; and Hakes, Paul E., 3,831,497.

Hakner, Robert. Progressive stamping device having work stations in a curvilinear path. 3,831,426, Cl. 72-405.000.

Haldopoulos, Ioakim, to Glasrock Products, Inc. Pressure differential filtering apparatus. 3,832,141, Cl. 23-259.000.

Haley, Finley Paul. Portable knock-down hoist apparatus. 3,831,773, Cl. 212-139.000.

Halkey-Roberts Corporation: *See—*
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Hall, Leland S.; and Heffan, Howard, to United States of America, Navy. Radiation absorber and intensity collimator unit. 3,832,564, Cl. 250-510.000.

Halliburton Company: *See—*
Broussard, Pat J.; and Fincher, Arnold, 3,832,196.
Edwards, Arnold Glen; and Jenkins, Charles J., 3,831,680.
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Hama, Kotaro: *See—*
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Hamada Printing Press Mfg., Co., Ltd.: *See—*
Shimizu, Shigeru, 3,831,930.

Hamaker, Ralph A., to Xerox Corporation. Foraminous vacuum bias roll transfer system. 3,832,055, Cl. 355-3.00r.

Hamasaki, Kamenosuke. Device for controlling seaborne vessels. 3,831,543, Cl. 114-145.00r.

Hamme, Lee F. Bearing dispenser. 3,831,810, Cl. 221-301.000.

Hammond, Philip D.; Clarke, William M.; and Denton, William I., to Olin Corporation. Continuous process for preparing aromatic isocyanates. 3,832,372, Cl. 260-453.0pc.

Hamton Engineering Associates, Inc.: *See—*
Swanson, Allen K., 3,832,051.

Hancock, Ronald David: *See—*
Allum, Keith George; Hancock, Ronald David; McKenzie, Samuel; and Pitkethl, Robert Chalmers, 3,832,404.

Hancovsky, John P., to Hi-Ho Products, Inc. Sectional creative toy. 3,831,934, Cl. 272-56.000.

Handrick, Kurt: *See—*
Hirz, Albert; Handrick, Kurt; and Kolling, Georg, 3,832,360.

Hanlon, Paul C., to Dover Corporation. Compressor valve of the slotted plate type. 3,831,627, Cl. 137-512.100.

Hann, Paul D., to Phillips Petroleum Company. Filaments of varying cross-sectional area. 3,832,272, Cl. 161-173.000.

Hannah, John, to Merck & Co., Inc. 2'-(4 Pyridyl)-6,16α-dimethyl-20-oxo-11β,17α,21-trihydroxy-pregna -4,6-dieno(3,2-C)pyrazole and intermediates in the production thereof. 3,832,346, Cl. 260-239.500.

Hanovia Lamps Limited: *See—*
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Hansen, Harold Valentine, to Deere & Company. Apparatus and method for distributing toxic agricultural chemicals. 3,831,867, Cl. 241-101.700.

Hanson, Harold W., Jr., to Par-Way Mfg., Co. Liquid spray head for producing rectangular spray patterns. 3,831,861, Cl. 239-520.000.

Hanzawa, Teruo: *See—*
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Harada, Masahide: *See—*
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Hardman, Dorsey Loraine; and Hughes, Philip Goggans, to General Electric Company. Industrial control relay. 3,832,657, Cl. 335-99.000.

Harkness, Joseph R.: *See—*
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Harmel, Richard P., Jr. Atmospherically isolated mixing apparatus with viscosity responsive indicator. 3,831,903, Cl. 259-1.00r.

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Harr, Jerome Danforth, to International Business Machines Corporation. Threshold extraction circuitry for noisy electric waveforms. 3,832,577, Cl. 307-235.00a.

Harrington, Charles L.: *See—*
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Harrington, Edward F., Jr., to Chemetron Corporation. Multiple-ply bellows. 3,831,498, Cl. 92-34.000.

Harris, Ben A., to Dynalec Corporation. Automatic telephone system with improved line selecting apparatus. 3,832,500, Cl. 179-18.0ge.

Harris, Eric Frank; and Roberts, John Francis Lloyd, to Imperial Chemical Industries Limited. Process for spinning high tenacity fibres. 3,832,436, Cl. 264-210.00f.

Harris, George E.: *See—*
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Hart, Anthony Christopher: *See—*
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Hart, Donald R.: *See—*
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Hartmann, Manfred, to Hilti Aktiengesellschaft. Magazine or container for receiving articles such as caseless propellant charges or compacts. 3,831,739, Cl. 206-2.000.

Hartzell, James R., to Piqua Aircraft Company. Electrically controlled governors. 3,831,615, Cl. 137-53.000.

Hartzog, Melvin: *See—*
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Hasegawa, Kazuhiko: *See—*
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Haselmayer, Karl: *See—*
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Haslett, Glenn Melvin: *See—*
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Hass, Robert H., to Union Oil Company of California. Exhaust gas conversion process. 3,832,443, Cl. 423-213.700.

Hasselblad, Fritz Victor: *See—*
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Haswell, John W.; and Haswell, Stanley A. Means for making pulleys. 3,831,414, Cl. 72-82.000.

Haswell, Stanley A.: *See—*
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Hatsukano, Yoshikazu: *See—*
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Hauni-Werke Korber & Co., KG: *See—*
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Haven, Harold A.; and Stewart, John A., to General Motors Corporation. Vehicle cooling system condition monitor. 3,832,662, Cl. 337-40.000.
Hawkins, James B.: *See—*
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Hawthorne, Vaughn T., to Keystone Industries, Inc. Draft gear assembly for locomotives and the like. 3,831,775, Cl. 213-43.000.
Hay, Warren: *See—*
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Hay, Warren H., to GTE Sylvania Incorporated. Method of coating photoflash lamp. 3,832,257, Cl. 156-198.000.
Hayashibara Biochemical Laboratories Incorporated: *See—*
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Hayden, Julian D., to Syndyne Corporation. Solenoid actuated switch. 3,832,658, Cl. 335-181.000.
Hayden, Owen; and Taylor, Derek, to United Kingdom Atomic Energy Authority. Heat exchangers. 3,831,673, Cl. 165-158.000.
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Horvath, Lajos, 3,831,360.
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Hedman, Jarl; and Westerlund, Tage, to Linden-Alimak AB. Apparatus for maintaining an elevator cage in the vertical position. 3,831,714, Cl. 187-12.000.
Heffan, Howard: *See—*
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Hehl, Karl. Injection mold for an injection molding machine for manufacturing two-component plastic objects. 3,832,110, Cl. 425-130.000.
Heiba, El-Ahmadi; and Rodewald, Paul Gerhard, to Mobil Oil Corporation. Alkoxylated hydroxyamide detergents. 3,832,367, Cl. 260-404.000.
Heil, Oskar. Electro-acoustic transducer. 3,832,499, Cl. 179-115.5pv.
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Heimburg, Fritz, to General Motors Corporation. Internal combustion engine fuel-air mixture preheating apparatus. 3,831,568, Cl. 123-122.00r.
Heine, Helmut A., to Propper Manufacturing Co., Inc. and Optotechnik Heine KG. Internal reading device for ophthalmological instruments. 3,832,042, Cl. 351-6.000.
Heinrich Machinery & Tool Mfg. Co., Inc.: *See—*
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Hek, Homer C., to Universal Dynamics Corporation. Loader. 3,832,005, Cl. 302-59.000.
Helgeland, Walter, to Varian Associates. Current measuring circuit and method. 3,832,642, Cl. 330-2.000.
Hellmer, Ernest W., to Continental Can Company, Inc. Corrugated slit web diverter. 3,831,929, Cl. 271-64.000.
Helton, Eugene L.; and Watts, Loyal O., to Caterpillar Tractor Company. Expandable retaining pin for telescopic parts. 3,831,298, Cl. 37-142.00a.
Hendricks, Thelma, 20% to Lee, Raymond, Organization, Inc., The. Dental floss unit. 3,831,611, Cl. 132-92.00r.
Hendrickson, Alan E. Data signal recognition apparatus. 3,832,685, Cl. 340-146.200.
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Hennart, Claude, to Ciba-Geigy AG. Pesticidal compositions containing phosphoric acid esters and elemental sulphur. 3,832,464, Cl. 424-175.000.
Henning, Georges. Variable contour miniature golf device. 3,831,949, Cl. 273-176.00h.
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Henzel, Russell A.; and Gayman, Byron G., to Honeywell Information Systems, Inc. Priority network for devices coupled by a multi-line bus. 3,832,692, Cl. 340-172.500.
Herchenroeder, Louis W., to Westinghouse Electric Corporation. Voltage reference source adjustable as regards amplitude phase and frequency. 3,832,641, Cl. 328-258.000.
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Hi-Ho Products, Inc.: *See—*
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Higuchi, Masaru; Yamada, Tadashi; and Suzuki, Ryoshu, to Daicel Ltd. Proceis for preparation of 3-hydroxy-2-alkyl-4-pyrone. 3,832,357, Cl. 260-345.900.
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Hijikata, Itsuo; Kasazaki, Masayoshi; Terada, Hideto; and Inoue, Takao, to Sintokogio, Ltd. Unit for applying covering sheet for use in vacuum sealed molding. 3,832,117, Cl. 425-388.000.
Hill Acme Company, The: *See—*
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Hill, Tore L.; and Mankowitsch, Robert. Combined screw driving and screw gripping tool. 3,831,648, Cl. 145-50.00d.
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Hoff, Karl Heinz; Kupper, Peter; Meyer, Joseph; Pagel, Werner; Schmitt, Heinz; and Nedelec, Maurice, to Saint-Gobain Industries. Apparatus for bending glass. 3,831,239, Cl. 29-125.000.

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Hoffman, Glenn J.; and Rawlins, Stephen L., to United States of America, Agriculture. Silver-foil psychrometer for measuring leaf water potential. 3,831,435, Cl. 73-77.000.

Hoffman, Jay, to Singer Company, The, mesne. Fluid rotor motion sensor. 3,831,454, Cl. 73-504.000.

Hoffman, Joseph H., to Westinghouse Electric Corporation. Fan hub and shaft assembly. 3,832,091, Cl. 416-184.000.

Hoffman La-Roche Inc.: *See—*
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Hoffman-La Roche Inc.: *See—*
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Hoffmann, George R.; Mason, Elmer B.; Jack, Graydon W.; and Campbell, Glenn A. Multi-armature and concentric motors. 3,832,581, Cl. 310-46.000.

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Hofle, Hubert. Movable platform exerciser. 3,831,935, Cl. 272-57.00b.

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Hoh, George L. K.; and Tsukamoto, Akira, to Du Pont de Nemours, E. I., and Company. Segmented copolyester adhesive and coating compositions. 3,832,314, Cl. 260-26.000.

Hoke Incorporated: *See—*
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Holiday, William G., to King Radio Corporation. Method and apparatus for assembling printed circuit boards. 3,831,250, Cl. 29-203.00b.

Hollinshead, William L.: *See—*
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Holloway, Robert L., to Chisholm-Ryder Company, Inc. Grading machine for beans and other objects. 3,831,752, Cl. 209-394.000.

Holmes, Curtis L.; and Brady, Lynn J., to CTS Corporation. Electrically conductive composition element and method of making the same. 3,832,308, Cl. 252-514.000.

Holmsten, Richard B. Header distribution system for ice rinks. 3,831,394, Cl. 62-235.000.

Holosonics: *See—*
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Homewood, Richard H.; Krukonis, Val J.; and Loszewski, Raymond C., to Avco Corporation. Safe explosive containing dycanofuroxane and method. 3,832,249, Cl. 102-23.000.

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Hoppmann, Kurt H.; Edmunds, George W.; and Schober, Horst A., to Hoppmann Corporation. Centrifugal method of sorting particulate articles. 3,831,734, Cl. 198-255.000.

Horie, Izumi: *See—*
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Horrocks, Raymond G., to Scott & Fetzer Company, The. Jacket stripper. 3,831,274, Cl. 30-90.400.

Horst, Robert L.; and Wolgemuth, Dennis L., to Armstrong Cork Company. Pattern length measurement and control by continuous statistical correlation. 3,832,064, Cl. 356-163.000.

Horvat, Rudolph M., to Ford Motor Company. Energy absorbing seat assembly. 3,832,003, Cl. 297-216.000.

Horvath, Lajos, to Heberlein & Co. AG. Texturized staple fiber structures. 3,831,360, Cl. 57-2.000.

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Hunter, Theodore K. Spray gun assembly having stir means. 3,831,850, Cl. 239-144.000.

Hurwitz, Mathew. Slip clutch for outboard motor. 3,831,401, Cl. 64-30.00r.

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Harris, Eric Frank; and Roberts, John Francis Lloyd, 3,832,436.
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Jacobson, Max. Film developing process. 3,832,178, Cl. 96-50.00r.

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Oman, Gary F., 3,832,670.
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Johnson, Tage George. Air conditioner covers. 3,831,321, Cl. 49-465.000.

Johnson, Thomas R.: *See*—
Freismuth, Richard J.; and Johnson, Thomas R., 3,831,567.

Johnson, Wallace J. S., to Up-Right, Inc. Continuous press. 3,831,516, Cl. 100-116.000.

Joly, Jean, to La Telemecanique. Fused connector. 3,832,676, Cl. 339-147.00p.

Jones & Laughlin Steel Corporation: *See*—
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Jones, Lawrence T.: *See*—
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Jones, Massena F. Adjustable stilts. 3,831,937, Cl. 272-70.100.

Joray, Marvin L.; Blake, Nathan L.; and Richards, Gerald F., to Avco Corporation. Sharpening mechanism particularly in combination with a forage chopper or the like. 3,831,325, Cl. 51-249.000.

Jordache, Rene. Cutter for cutting mitred edges. 3,831,275, Cl. 30-116.000.

Jorgensen, Gunnar, to A/S Attas and Smidth, F. L., & Co. A/S. Atomizing burner. 3,831,856, Cl. 239-422.000.

Jorgenson, Edward Bjarnie. Logging grapple and hauling assembly. 3,831,772, Cl. 212-84.000.

Joyce, Arthur W., to Dennison Manufacturing Company. Decorator loading apparatus. 3,831,737, Cl. 198-57.000.

Judge, Edward E., Jr. Servo control for manufacturing stations. 3,832,082, Cl. 408-10.000.

Judith, Vincent J., to Excello Corporation. Processor unit for data retrieval and processing. 3,832,694, Cl. 340-172.500.

Juhasz, John E.: *See*—
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Jullard, Yves, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Device for controlling the heddles of the harness of a loom. 3,831,637, Cl. 139-1.00e.

Juneja, Subhash C., to Canadian Patents and Development Limited. Melamine-dicyandiamide-base resin solutions. 3,832,316, Cl. 260-29.40r.

K & M Enterprises, Incorporated: *See*—
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Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
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Kahmann, Albrecht, to Wyss, Escher, G.m.b.H. Grinding apparatus for fibrous material. 3,831,868, Cl. 241-245.000.

Kaida, Masaaki; and Yasuda, Shigeo, to Bridgestone Tire Company Limited and Mitaka Instrument Company, Limited. Pressure change detecting system for rotating body. 3,832,681, Cl. 340-58.000.

Kaiser Aluminum & Chemical Corporation: *See—*
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Kane, William S.; and Cardwell, Paul H., to Deepsea Ventures, Inc. Process for recovering manganese from its ore. 3,832,165, Cl. 75-80.000.

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Kaneko, Yuichiro; Teraoka, Fuminori; Kubota, Tatsushi; and Nishikawa, Takehiko, to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho. Safety belt winding energy accumulator device for use in vehicles. 3,831,971, Cl. 280-150.0sb.

Kansai Paint Company Limited: *See—*
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Kanzaki Kokyukoki Mfg. Co., Ltd.: *See—*
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Kaplan, Ronald. Brush construction. 3,831,218, Cl. 15-192.000.

Kapolyi, Laszlo; Kaszanitzky, Ferenc; Lazar, Ferenc; and Vamos, Gyorgy, to Tatabanyai Szenbanyak. Production of aluminum and its alloys. 3,832,164, Cl. 75-68.00b.

Kapron, Felix P., to Corning Glass Works. Coupler for optical waveguide light source. 3,832,028, Cl. 350-96.0wg.

Kardashian, Vahram S., to Honeywell Inc. Dual wire intruder detector. 3,832,704, Cl. 340-258.00r.

Karlsson, Gosta; and Nilsson, Borje, to Allmanna Svenska Elektriska Aktiebolaget. Means for dip-forming. 3,832,477, Cl. 13-27.000.

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Karmas, George. Derivatives of the 2-(lower alkyl)-3-(lower alkyl)-4-phenyl-3- or 4-cy clohexenecarboxylic acids. 3,832,376, Cl. 260-469.000.

Karpisek, Ladislav Stephan, to Nashua Australia Pty., Limited. Copy Machine feeding means. 3,831,829, Cl. 226-83.000.

Karr, Fred A., to Shasta Beverages (Division of Consolidated Food Corporation). Carbonated beverage system. 3,832,474, Cl. 426-477.000.

Kasazaki, Masayoshi: *See—*
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Kashio, Toshio, to Casio Computer Kabushiki Kaisha. Tabulating system. 3,832,697, Cl. 340-172.500.

Kasper, Witold A. Aircraft wing with vortex generation. 3,831,885, Cl. 244-40.00a.

Kaszanitzky, Ferenc: *See—*
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Kato, Taizo: *See—*
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Kawai, Atsushi; Katsuyama, Takehiro; Suzuki, Migaku; and Ohta, Hidenori, to Mitsubishi Rayon Company Limited. Paper or non-woven fabric of regenerated cellulose fibers and method for producing the same. 3,832,281, Cl. 162-157.00c.

Kawai, Sadaharu: *See—*
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Kawakami, Hajime; and Yamamoto, Fumihiko, to Nippon Keori Co., Ltd., The. Spinning machines having spindle rails movable for tube exchanging. 3,831,364, Cl. 57-54.000.

Kawamoto, Yukio: *See—*
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Kawanishi, Kunishisa; Shimizu, Seigo; and Baba, Takio, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Side shift clamp device. 3,831,795, Cl. 214-731.000.

Kawauchi, Masataka: *See—*
Ikeda, Toshimichi; Kawauchi, Masataka; Matsuzaki, Atsushi; and Suzuki, Masayuki, 3,831,683.

Kayatz, Karl-Heinz, to Fuller Company. Method and apparatus for treatment of particulate material. 3,831,291, Cl. 34-20.000.

Kays, David D.; Frank, Kurt F.; and Longwell, Paul A., to Aerojet-General Corporation. Preheaters. 3,832,289, Cl. 202-174.000.

Keates, Richard H.: *See—*
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Keaton, Morgan G. Collapsible cart. 3,831,958, Cl. 280-36.00c.

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Gebhard, Harold C.; and Keller, Alfred M., 3,831,409.

Keller, George C. Variable height garment rack. 3,831,768, Cl. 211-1.000.

Kelley, Leon O. Cable laying plow equipped with a cutting chain. 3,831,299, Cl. 37-191.00a.

Kellogg, Harlan F., to Kirsch Company. Shelving system. 3,831,533, Cl. 108-64.000.

Kemp, Rodney J., to Eastman Kodak Company. Aromatic compositions for treating silver images. 3,832,175, Cl. 96-29.001.

Kempster, Edward, to Thyssen (Great Britain) Limited. Shuttering for use in a mine and methods of use thereof. 3,831,384, Cl. 61-35.000.

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Dye, John F., 3,831,446.
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Kennel, Michael; and Quiquerez, Joseph, to Societe Anonyme dite: Compagnie Francaise de Raffinage. Method for the preparation of a bituminous paving compositions and compositions obtained thereby. 3,832,200, Cl. 106-281.00r.

Kenney, Edward S.: *See—*
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Kenney, Harold E.; Donahue, Edward T.; and Maerker, Gerhard, to United States of America, Agriculture. Lithium polycyanoethylated keto fatty soap based greases. 3,832,368, Cl. 260-404.000.

Keppel, Charles M., to General Motors Corporation. Passive restraint belt arrangement for a vehicle occupant. 3,831,974, Cl. 280-150.0sb.

Ker Shaw, Stuart Walter; and James, Nigel Anthony, to International Nickel Company, Inc., The. Nickel alloy with good stress-rupture strength. 3,832,167, Cl. 75-170.000.

Kern, Richard A., to General Motors Corporation. Variable tracking cam follower. 3,831,457, Cl. 74-569.000.

Kershaw, Sydney L.: *See—*
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Kerwood, Joseph Edward: *See—*
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Kessell, Archie, to Rohe Scientific Corporation. Adjustable syringe plunger. 3,831,601, Cl. 128-218.0pa.

Keystone Industries, Inc.: *See—*
Hawthorne, Vaughn T., 3,831,775.

Kheifets, Rafail Efimovich: *See—*
Anikanov, Nikolai Ivanovich; Grachev, Leonid Pavlovich; Goltsman, Samuil Aronovich; Zak, Grigory Iosifovich; Oleinik, Alexandr Ivanovich; Radutsky, Grigory Avramovich; Kheifets, Rafail Efimovich; and Baburin, Evgeny Arkadievich, 3,831,781.

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Aarna, Agu Yanovich; Kiisler, Karl Ritsovich; Kristyanson, Peep Gerkhardovich; Tanner, Juri Albert-Mikhaelovich; Vabaoya, Juri Felixovich; Vaitsenberg, Gershonovich; Rokk, Juri Khindrekovich; and Matvere, Toomas Oskarovich, 3,832,251.

Kiko, Frederick J., to Lorain Products Corporation. Compensated transformer circuit utilizing negative capacitance simulating circuit. 3,832,654, Cl. 333-24.00r.

Kilgore, Lee A.; and Oleson, Kenneth A., to Westinghouse Electric Corporation. Combination wet and dry cooling system for a steam turbine. 3,831,667, Cl. 165-96.000.

Kime, Roger A. Apparatus for coating filamentary material. 3,831,551, Cl. 118-7.000.

King, Barry B.; and King, Ralph E. Alarm device. 3,832,705, Cl. 340-280.000.

King, James F., to Lockheed Missiles & Space Company, Inc. Steerable articulation joint. 3,831,693, Cl. 180-14.00a.

King, Michael C., to Bell Telephone Laboratories, Incorporated. Synthetic hologram generation from a plurality of two-dimensional views. 3,832,027, Cl. 350-3.500.

King Radio Corporation: *See*—
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King, Ralph E.: *See*—
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Kinneging, Johannes Wilhelmus: *See*—
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Kinoshita, Koichi; Uehara, Shiro; and Nagame, Hiroshi, to Katsuragawa Denki Kabushiki Kaisha. Method of electrophotography with a photoconductive layer manifesting persistent internal polarization. 3,832,169, Cl. 96-1.00r.

Kinsey, Lewis R. Exchangeable elements for a storage battery. 3,832,237, Cl. 136-134.000.

Kinsman, Gordon F., to Polaroid Corporation. Photographic film assemblage. 3,832,731, Cl. 354-304.000.

Kintner, Edwin K.; and Titley, C. Edward. Check Valve. 3,831,628, Cl. 137-512.150.

Kirsch Company: *See*—
Kellogg, Harlan F., 3,831,533.

Kita, Masaaki, to Kabushiki Kaisha Komatsu Seisakusho. Fully automatic forging press. 3,831,425, Cl. 72-405.000.

Kitamura, Yoshiaki; and Misono, Shigemi, to Kabushiki Kaisha Daini Seikosha. Apparatus for effecting oscillatory movement of an output member. 3,831,500, Cl. 92-68.000.

Kitani, Toshio; and Goto, Hisao, to Osaka Transformer Co., Ltd. Method for electrical arc welding. 3,832,523, Cl. 219-137.000.

Kitaoka, Yoji; Murata, Katsuhide; Hama, Kotaro; Hashimoto, Michio; and Fujiyoshi, Kenji, to Mitsui Shipbuilding and Engineering Co., Ltd. and Mitsui Petrochemical Industries Limited. Process and apparatus for disposal of plastic wastes. 3,832,151, Cl. 48-11.000.

Klasson, George A. Starting and stabilizing apparatus for a gas-tungsten arc welding system. 3,832,513, Cl. 219-75.000.

Kleeberg, Wolfgang; Rubner, Roland; and Kuehn, Eberhard, to Siemens Aktiengesellschaft. Single-phase film-forming photo-cross-linkable systems. 3,832,187, Cl. 96-115.00r.

Klein, Carl F.; and Bailey, James R., to Johnson Service Company. Motion detection apparatus having the ability to determine the direction of motion and range of a moving object. 3,832,709, Cl. 343-5.0pd.

Klein, Georg Anton: *See*—
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Kletschka, Harold D.; and Rafferty, Edson H., to Bio-Medicus, Inc. Suture bridges. 3,831,608, Cl. 128-335.000.

Kline, Robert H.; and Grosser, Christian E., to Peli-Can, Inc. Receptacles for litter and the like. 3,831,838, Cl. 232-43.200.

Klingensmith, James D.; and Latkey, George J., to Aluminum Company of America. Connecting bracket for building structure. 3,831,338, Cl. 52-752.000.

Kmiecik, Leopold J., to International Telephone and Telegraph Corporation. Method and apparatus for testing low water fuel cut-off switches. 3,831,429, Cl. 73-1.00r.

KMS Industries, Inc.: *See*—
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Knapsack Aktiengesellschaft: *See*—
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Knickerbocker, Karl. Single-vend dispensing machine. 3,831,809, Cl. 221-227.000.

Kniff, August A. Tow bar means. 3,831,980, Cl. 280-402.000.

Knifton, John F.; and Suggitt, Robert M., to Texaco Inc. Homogeneous catalysts useful in the reduction of nitroaromatics to amines. 3,832,401, Cl. 260-570.80r.

Knight, Homer A.: *See*—
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Knight, Ronald Edward, to Hanovia Lamps Limited. Ink drying reflector system. 3,831,289, Cl. 34-4.000.

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Kobayashi, Harumi: *See*—
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Kobayashi, Sanzo. Container having magnetic and latch fastening means. 3,831,986, Cl. 292-201.000.

Kobayashi, Shigeo: *See*—
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Kobe Steel, Limited: *See*—
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Kobetz, Paul: *See*—
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Kobetz, Paul; Laran, Roy J.; and Johnson, Robert W. Jr., to Ethyl Corporation. Process for the manufacture of beryllium hydride. 3,832,456, Cl. 423-645.000.

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Koch, Victor: *See*—
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Koenig, Karl-Heinz; Kolbinger, Rudolf; Zeeh, Bernd; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Substituted chlorocarbonylurea. 3,832,389, Cl. 260-479.00c.

Koeppe, Douglas F. Keyboards. 3,831,730, Cl. 197-98.000.

Koga, Issac; Kobayashi, Shigeo; and Okamoto, Isao, to Kokusai Denshin Denwa Kabushiki Kaisha. Method for measuring parameters of quartz crystal units and fixture for carrying out the same. 3,832,631, Cl. 324-56.000.

Koger & Wade Manufacturing Corporation: *See*—
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Koger, Joseph A., Jr.; and Wade, James L., to Koger & Wade Manufacturing Corporation. Conduit berding machine. 3,831,421, Cl. 72-307.000.

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Kojima, Katue: *See*—
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Kojima, Tatsuo, to Murata Manufacturing Co., Ltd. Step-by-step variable resistor assembly. 3,832,671, Cl. 338-188.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
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Kopf, David, Systems, mesne: *See*—
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Kopf, J. David; Bacon, Cole D.; and Schwartz, Teryl W., to Kopf, David, Systems, mesne. Colorimeter for detecting blood leaks in an artic ficial kidney machine. 3,832,067, Cl. 356-181.000.

Koppers Company, Inc.: *See*—
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Mackal, Glenn H.; and Lardner, George E., to Halkey-Roberts Corporation. Check valve. 3,831,629, Cl. 137-525.000.
MacKay, George R. Point-vector concept assessment method and apparatus. 3,831,295, Cl. 35-22.00r.
MacKew, James, to Power Wheels Corporation. Apparatus for moving vehicles and the like. 3,831,694, Cl. 180-19.00r.
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Matsui, Toshiro; Nakagawa, Masashi; Utagawa, Tadashi; and Tokunaga, Makoto, to Tokyo Shibaura Electric Co., Ltd. Method of manufacturing a semiconductor device. 3,832,225, Cl. 117-212.000.

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McWhorter, Daniel M., to Kendall Company, The. Urine meter and collection receptacle. 3,831,453, Cl. 73-427.000.

McWhorter, Daniel M.; and Villari, Frank K., to Kendall Company, The. Openable closure with drip site. 3,831,823, Cl. 222-490.000.

Meacham, George B. K., to Eaton Corporation. Vehicle occupant restraint system. 3,831,973, Cl. 280-150.0ab.

Means, David K.; and Luther, Thomas M., to Reliance Electric Company. Data-transmission apparatus. 3,832,689, Cl. 340-147.0lp.

Mech, Harold W., to Motorola, Inc. Machine and method for cutting brittle materials using a reciprocating cutting wire. 3,831,576, Cl. 51-12.000.

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Merrill, Edward W., to River, Charles, Foundation, Trustees of the. Hydrophilic silicone composition and method. 3,832,458, Cl. 424-19.000.

Merritt, Will D., Jr., to General Electric Company. Organopolysiloxane-polycarbonate block copolymers. 3,832,419, Cl. 260-824.00r.

Messina, Steve J., to Ethyl Corporation. Allyl halide-monoolefin condensation product. 3,832,412, Cl. 260-654.00r.

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Miller, Charles Frederick. Assembling and securing machine. 3,831,252, Cl. 29-203.00b.

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Miller, Marvin E., to Warwick Electronics Inc. Dynamic convergence circuit. 3,832,594, Cl. 315-13.00c.

Miller, Melvin N.; and Levine, Marshall S., to Geometric Data Corporation. Pattern recognition system. 3,832,687, Cl. 340-146.3ma.

Miller, Robert G. Impact wrench. 3,831,468, Cl. 81-52.300.

Miller, Wendell V.; and Friedrichsen, Thomas, to Massillon-Cleveland Akron Sign Company, The. Pole banner sign construction. 3,831,304, Cl. 40-125.00g.

Mills, Marvin L. Electromagnetic motors and process of their operation. 3,832,608, Cl. 318-37.000.

Minamihata, Shigeaki; and Niimi, Masayasu, to Hitachi, Ltd. Circuit for delaying and shaping synchronizing pulse. 3,832,572, Cl. 307-106.000.

Mine, Akihiko: *See—*
Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, 3,832,351.

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Minnesota Mining and Manufacturing Company: *See—*
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Minolta Camera Kabushiki Kaisha: *See—*
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Misenheimer, Ernest L., III. Safety fastening device. 3,831,987, Cl. 292-246.000.
Misomex Aktiebolag: *See—*
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Misono, Shigemi: *See—*
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Mitchell, Bobby Lee. Automatic vehicle light control system for daylight driving. 3,832,597, Cl. 316-82.000.
Mitchell, Everett R.: *See—*
Tumlinson, James H. III; Mitchell, Everett R.; Browner, Stella M.; Mayer, Marion S.; Green, Nathan; Hines, Ronald W.; and Lindquist, Donald A., 3,832,461.
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Mitchell, Richard R.; and Van Der Bor, Robert, to Akzona Incorporated. Salt crystal conglomerates. 3,832,446, Cl. 423-267.000.
Mitchell, Robert S.: *See—*
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Mitchell, William E.: *See—*
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Mittendorf, Theodor H.; and Bennett, Dale L., said Bennett assor. to said Mittendorf, Theodor H. Vehicle insect protection apparatus. 3,831,696, Cl. 180-68.00p.
Miyahara, Hiromitsu: *See—*
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Mobil Oil Corporation: *See—*
Heiba, El-Ahmadi; and Rodewald, Paul Gerhard, 3,832,367.
Rosinski, Edward J.; and Rubin, Mae K., 3,832,449.
Mocarski, Zenon R., to S. R. C. Laboratories, Inc. Variable flow, pressure venturi nozzle. 3,831,855, Cl. 239-416.000.
Moellmann, Heinz F., to Avco Corporation. Turbomachinery and method of manufacturing diffusers thereof. 3,832,089, Cl. 415-207.000.
Mohr, Hans; Weigel, Peter; and Metzl, Kurt, to Nixdorf Computer AG. Structural unit for frame construction. 3,831,328, Cl. 52-145.000.
Moise, Norton L.: *See—*
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Molettieri, John B. Device for placement of football. 3,831,940, Cl. 273-55.00b.
Molson Companies Limited, The: *See—*
Duncan, Alex R., 3,831,995.
Mondshine, Thomas C., to N L Industries, Inc. Method of producing and using a gelled oil base packer fluid. 3,831,678, Cl. 166-288.000.
Monnet, Francois. Apparatus for monitoring carburetors or other gasoline-consumption devices. 3,831,440, Cl. 73-113.000.
Monsanto Company: *See—*
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Coran, Aubert Yaucher; and Kerwood, Joseph Edward, 3,832,348.
Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., 3,832,321.
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Schleppnik, Alfred A.; and Wilson, John B., 3,832,369.
Moore, Alvin Edward. Puncture-resistant tire assembly. 3,831,653, Cl. 152-195.000.
Moore, Charles H. Method of producing two pipe connections from a single forging. 3,831,422, Cl. 72-340.000.
Moore, Harold K. Vehicle outrigger pad structure. 3,831,774, Cl. 212-145.000.
Moore, Richard L.; Moore, Vaughn; and Moore, Warren N. Double-hulled boats. 3,831,212, Cl. 9-6.000.
Moore, Robert R. Knee brace. 3,831,467, Cl. 128-80.00c.
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Moorehead, James R., to Boeing Company, The and Aeritalia S.p.A. Thrust reverser. 3,831,376, Cl. 60-226.00a.
Moorhead, William V. Concret forming apparatus and process. 3,832,079, Cl. 404-72.000.
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Morgan, Charles R., to Grace, W. R., & Co. Curable compositions containing solid styreneallyl alcohol copolymer based polyenes and polythiols. 3,832,421, Cl. 260-859.00r.
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Mori, Keisuke; Yamada, Takehiro; Nakamoto, Katsumi; Onaka, Hirosi; Yamamoto, Takeshi; and Kato, Taizo, to Nippon Steel Corporation and Asahi Glass Company, Limited. Heat insulating durable tuyere. 3,831,918, Cl. 266-41.000.
Morin, Albert Z. Method of and apparatus for reducing pollution caused by exhaust gases of an internal combustion engine. 3,831,377, Cl. 60-274.000.
Morin, Gerard, to Societe Anonyme D.B.A. Constant-velocity joint. 3,831,400, Cl. 64-21.000.
Morin, James A.: *See—*
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Moriya, Nobuyoshi, to Mansei Kogyo Kabushiki Kaisha. Liquefied gas fueled lighter. 3,832,126, Cl. 431-131.000.
Moriya, Nobuyoshi, to Mansei Kogyo Kabushiki Kaisha. Ignition device. 3,832,127, Cl. 431-344.000.
Morris, Billy D. Adjustable static pressure or vacuum source and indicator. 3,831,431, Cl. 73-4.00r.
Morris, Jack, to Olin Corporation. Method of fabricating a metal tubular heat exchanger having internal passages therein. 3,831,246, Cl. 29-157.30u.
Morsell, Arthur Lee; and Moise, Norton L., to Xonics, Inc. X-ray system with aligned source and slits. 3,832,546, Cl. 250-315.000.
Morton-Norwich Products, Inc.: *See—*
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Moser, Peter, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Tiltable converter. 3,831,917, Cl. 266-36.00p.
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Weber, Howard F., 3,831,571.
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Mueller, Alf, to Daimler-Benz Aktiengesellschaft. Front wheel suspension for motor vehicles. 3,831,970, Cl. 280-124.00a.
Mueller, Fritz Kurt; Martin, Billy Otis; and Cherry, Robert, to Royal Medical Corporation. Temperature-sensing device. 3,832,669, Cl. 338-28.000.

Mueller, Otto. Differential transmisssion. 3,831,461, Cl. 74-711.000.

Muench, Paul W., to Borg-Warner Corporation. Control arrangement for absorption refrigeration system. 3,831,393, Cl. 62-141.000.

Mugford, Charles C., to Farr Company. Air filter assembly. 3,831,355, Cl. 55-484.000.

Mukai, Toshihiko: *See—*
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Muller, Thomas P.; and Sitton, Ellis A., to Caterpillar Tractor Co. Parking brake assembly for track-type vehicles. 3,831,718, Cl. 188-170.000.

Mullings, Donald M., to General Electric Company. A-coil with improved air deflector. 3,831,670, Cl. 165-124.000.

Mullins, Albert A., to Schlumberger Technology Corporation. Retainer packer with improved valve system. 3,831,677, Cl. 166-128.000.

Muntean, George L.: *See—*
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Mura, George J.: *See—*
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Murakami, Noboru, to Aisin Seiki Kabushiki Kaisha. Control system for automatic transmission. 3,831,465, Cl. 74-869.000.

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Mutch, John, to Guthrie Industries Limited. Process for continuously forming a polymeric resinous layer from a multicomponent liquid reactive mixture. 3,832,427, Cl. 264-39.000.

Myers, Robert A., to Ford Motor Company. Controlled collapse vehicle front end structure. 3,831,997, Cl. 296-28.00r.

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Nadler, Morton; and Masson, Christian, to Societe Honeywell Bull (Societe Anonyme). Character-identification device. 3,832,683, Cl. 340-146.3ma.

Nagamatsu, Katsumi; and Saito, Takashi, to Canon Kabushiki Kaisha. Method of and apparatus for electronic color photography and photosensitive member used for the same. 3,832,170, Cl. 96-1.200.

Nagame, Hiroshi: *See—*
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Nagasima, Takeomi, to Asahi Glass Company, Limited. Defogging glass plate. 3,832,527, Cl. 219-522.000.

Nagata, Masamichi, to Kabushiki Kaisha Hasegawa Hamono Seisakusho. Combination scissors for both hair-cutting and hair-thinning. 3,831,277, Cl. 30-195.000.

Nagata, Minoru; Okabe, Takahiro; and Masuhara, Toshiaki, to Hitachi, Ltd. Semiconductor electronic circuit with semiconductor bias circuit. 3,832,644, Cl. 330-22.000.

Nakagawa, Jihei, to Olympus Optical Company Limited. Super wide-angle lens systems. 3,832,037, Cl. 350-214.000.

Nakagawa, Masashi: *See—*
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Nakaguchi, Glenn M.; Wang, Ting-I; and Caserio, Frederick F., Jr., to Atlantic Richfield Company. Acetal dimers of cyclic acetals. 3,832,356, Cl. 260-340.900.

Nakamoto, Katsumi: *See—*
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Nakamura, Koichi, to Kabushiki Kaisha Suwa. Reading system for tags encoded with bars of different widths. 3,832,529, Cl. 235-61.11e.

Nakamura, Toshio; and Kawai, Sadaharu, to Hitachi, Ltd. Spiral spring units for pressing brushes. 3,831,925, Cl. 267-156.000.

Nakanishi, Michio; and Mukai, Toshihiko, to Sumitomo Chemical Company, Ltd., mesne. Insecticidal chrysanthemote compositions and their method of use. 3,832,467, Cl. 424-285.000.

Nakao, Hisaji; Naruse, Katutoshi; Hasegawa, Kazuhiko; Kawade, Sadao; Tokura, Yasufumi; and Matsuno, Kazuo, to Toyoda Koki Kabushiki Kaisha. General purpose sequence controller. 3,832,696, Cl. 340-172.500.

Nakatani, Eizo: *See—*
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Nakayama, Fukuzo, to Japan Non-Slip Pavement Co., Inc. Method and apparatus of manufacturing non-slip pavement blocks and product thereof. 3,832,078, Cl. 404-44.000.

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Narayan, Subrahmanyam Yegna, to RCA Corporation. Dynamic dividing circuit for dividing an input frequency by two. 3,832,651, Cl. 331-107.00g.

Naruse, Katutoshi: *See—*
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Naya, Mikio; Yamaguchi, Haruki; and Horie, Izumi, to Minolta Camera Co., Ltd. Three color meter with a calculator. 3,832,068, Cl. 356-228.000.

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Nederlof, Anton Marie, to U.S. Philips Corporation. Hot-gas engine. 3,831,380, Cl. 60-524.000.

Needham, David Alan, to Cyprane Limited. Anaesthesia machines. 3,831,599, Cl. 128-188.000.

Neefe, Charles W. Method of reshaping the cornea. 3,831,604, Cl. 128-260.000.

Neely, Tom D.; and Linneen, Jack M. Mechanism for transporting loads into a high rise building. 3,831,712, Cl. 187-2.000.

Neely, Victor I.: *See—*
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Negado, Cesar T. Collision guard device. 3,831,921, Cl. 267-139.000.

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Neitzel, Ulrich E. G., to Irving Trust Company, mesne. Crystallization of sodium chloride. 3,832,143, Cl. 23-296.000.

Nelson, Alfred M.; McPherson, Robert G.; and Martin, Maurice s., to Cubic Industrial Corporation, mesne. Selectro mechanism including cassette storage. 3,831,749, Cl. 209-110.500.

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Nelson, Nels S.; and Piper, Harlow H., to Caterpillar Tractor Company. Seat belt slack adjuster mechanism. 3,831,226, Cl. 24-196.000.

Nelson, Richard B.; Lien, Erling L.; and Miram, George V., to Varian Associates. Magnetic structure for focusing of linear beams. 3,832,596, Cl. 315-3.500.

Nelson, Richard Stuart; Mazey, David John; and Hudson, John Adrian, to United Kingdom Atomic Energy Authority. Methods of treating steel surfaces to modify their structure. 3,832,219, Cl. 117-93.300.

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Nesslage, Donald J.; and Yu, Lin S., to Phelps Dodge Industries, Inc. Copper-base alloy containing titanium and antimony. 3,832,241, Cl. 148-12.700.

Neubauer, Lewis, 20% to Lee, Raymond, Organization, Inc., The. Word plus word game. 3,831,938, Cl. 273-1.00r.

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Newkirk, Reginald H. Vibratory cushion. 3,831,591, Cl. 128-33.000.

Newman, Nicholas S.; Alexander, Robert R.; and Sheldon, Donald A., to Kendall Company, The. Filter media. 3,831,766, Cl. 210-508.000.

Newton, Alan Branford, to Imperial Chemical Industries Limited. Polysulphones prepared from 3-(4-chlorophenylsulphonyl) phenol and method of preparation. 3,832,331, Cl. 260-49.000.

Newton, William D., II; and Smith, Darrell L. Overhead light suspension hanger. 3,831,894, Cl. 248-327.000.

Nicholls, Lawrence George, to Girling Limited. Telescopic gas springs. 3,831,919, Cl. 267-34.000.

Nicholson, James, to Hickson's Timber Impregnation Co., (G.B.) Limited. Wood-treatment compositions containing hexavalent chromium. 3,832,463, Cl. 424-131.000.

Nicita, John, to Power Technology Corporation. Gas turbine engine and counterflow heat exchanger with outer air passageway. 3,831,374, Cl. 60-39.51r.

Nickel, Frank C.; and Swanson, James R., to Sperry Rand Corporation. Partitioning circuit employing external interrupt signal. 3,832,695, Cl. 340-172.500.

Nickel, Werner, to Leitz, Ernst, GmbH. Exposure control device for photographic cameras. 3,832,723, Cl. 354-51.000.

Nicodemus, Paul Otis, to General Electric Company. Method of rendering chlorosulfonated polyethylene rubber resistant to adherence of dirt, and the dirt resisting products thereof. 3,832,231, Cl. 117-218.000.

Nieman, John R.; and Worman, Roger A., to Caterpillar Tractor Co. Casting mold with constricting device. 3,831,662, Cl. 164-362.000.

Niendrof, Erling H., to Expert Automation, Inc. Current shunt-current relay assembly. 3,832,521, Cl. 219-131.000.

Niida, Taro; Inoue, Shigeharu; Tsuruoka, Takashi; Shomura, Takashi; Kondo, Yasumitsu; Ogawa, Yasuaki; Watanabe, Hiroshi; Sekizawa, Yasuharu; Watanabe, Tetsuro; and Igarashi, Hiroshi, to Meiji Seika Kaisha, Ltd. Methanephosphinylethane substituted amid trimr of alanine. 3,832,394, Cl. 260-502.500.

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Nishide, Katsuhiko; Yamanouchi, Teruo; and Kinjo, Kikuo, to Canon Kabushiki Kaisha. Photosensitive material for electrophotography. 3,832,172, Cl. 96-1.600.

Nishikawa, Hideo, to Wada Seiko Kabushiki Kaisha. Rotation preventive device. 3,832,024, Cl. 308-236.000.

Nishikawa, Masao: *See*—
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Nishio, Yasuhiro; Okamoto, Zenichiro; and Hiromoto, Yoshinori, to Mitsubishi Kukogyo Kabushiki Kaisha. Electroslag welding process. 3,832,512, Cl. 219-73.000.

Nissan Motor Company, Limited: *See*—
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Nisshin Steel Co., Ltd.: *See*—
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Nogita, Shunsuke; and Kawamoto, Yukio, to Hitachi, Ltd. Method of measuring the flow rate in plural-flow system. 3,831,447, Cl. 73-195.000.

Nogiwa, Yasuo: *See*—
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Nomiya, Kosei; Minorikawa, Kazuo; Torii, Shuichi; and Hatsukano, Yoshikazu, to Hitachi, Ltd. Static flip-flop circuit. 3,832,578, Cl. 307-279.000.

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Nordine, Clifford A. Automatic row marker apparatus. 3,831,706, Cl. 180-98.000.

Noren, Oscar B.; Garland, Carl C.; and Kwarsick, Edmund J., to Parke, Davis & Company. Capsule handling apparatus. 3,831,476, Cl. 83-170.000.

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North American Electronics Corporation: *See*—
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North, Joyce A.; and Kuckro, Gerard W., to National Distillers and Chemical Corporation. Flame retardant compositions. 3,832,326, Cl. 260-42.290.

North 40 Manufacturing Inc.: *See*—
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Northrop Corporation: *See*—
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Northup, Francis B.; and Hart, Donald R., to Spanco Yarns, Inc. Yarn structure and method of making same. 3,831,369, Cl. 57-144.000.

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Nudenberg, Walter: *See*—
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Nugent, John L.; and Claypool, Harry W., to Westinghouse Electric Corporation. Low noise RF signal generator. 3,832,653, Cl. 331-116.00r.

Nutt, Wallace H., to Teledyne Canada, Limited. Sheet metal panel assembly. 3,831,799, Cl. 220-4.00f.

Nye, James Leroy: *See*—
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Obenchain, Keith T.; and Jimerson, James C., to Mallory, P. R., & Co., Inc. Column type stacked plate capacitor. 3,832,607, Cl. 317-261.000.

Obenchain, Richard F. Process for producing metal from metal oxide pellets in a cupola-type vessel. 3,832,158, Cl. 75-38.000.

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Oceanetics, Inc.: *See*—
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Ochoa, Jose Corona. Therapeutic tub for the treatment of burned patients. 3,831,593, Cl. 128-66.000.

O'Connor, Michael P., Jr., to Carborundum Company, The. Composite refractory articles. 3,832,273, Cl. 161-182.000.

Odawara, Tsugumu, to Fuji Kikai Kogyo Kabushiki Kaisha. Automatic shoe polishing machine. 3,831,217, Cl. 15-34.000.

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Ohashi, Shin-Ichi; and Fukushima, Isao, to Hitachi, Ltd. Output control device of FM receiver. 3,832,638, Cl. 325-347.000.

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Arikawa, Masayasu; Ohi, Atsushi; Arai, Toshio; Iochi, Akihiko; and Kada, Hironosuke, 3,832,522.

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Ohnishi, Yasushi, to Hitachi, Ltd. Fluorescence spectrophotometer. 3,832,555, Cl. 250-458.000.

Ohsawa, Mitsuo, to Sony Corporation. Transistor circuit with slow voltage rise and fast voltage fall characteristic. 3,832,627, Cl. 212-2.000.

Ohta, Hidenori: *See—*
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Okabe, Takahiro: *See—*
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Okada, Hideya; Shimada, Haruo; and Yamamoto, Kazuo, to Nippon Steel Corporation. Steel sheet having excellent rust resistance. 3,832,166, Cl. 75-125.000.

Okamoto, Isao: *See—*
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Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsuikeda, Mitsuhiro; Dume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Process for producing 1-substituted benzodiazepine derivatives. 3,832,344, Cl. 260-239.0d.

Okamoto, Takio: *See—*
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Okamoto, Zenichiro: *See—*
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O'Keeffe, Terence W., to Westinghouse Electric Corporation. Method and apparatus for electron beam alignment with a substrate by schottky barrier contacts. 3,832,561, Cl. 250-492.000.

O'Keeffe, Terence William, to Westinghouse Electric Corporation. Method and apparatus for electron beam alignment with a member by detecting cathodoluminescence from oxide layers. 3,832,560, Cl. 250-492.000.

Oki Electric Industry Co., Ltd.: *See—*
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Olivetti, Ing., C., & C., S.p.A.: *See—*
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Olliffe, David William, to M.S.E. Holdings Limited. Centrifuges. 3,832,614, Cl. 318-313.000.

Olson, Allan M., to Canip Ways Inc. Pack frame with swiveling hip-riders. 3,831,827, Cl. 224-25.00a.

Olson, Paul E.; and Knight, Homer A., to Westinghouse Air Brake Company. Fluid pressure operable servo positioner. 3,831,490, Cl. 91-387.000.

Olympus Optical Company Limited: *See—*
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Oman, Gary F., to Johnson Service Company. Multiple precision potentiometer. 3,832,670, Cl. 338-124.000.

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Ondetti, Miguel A.; and Pluscec, Josip, to Squibb, E. R., & Sons, Inc. Peptide enzyme inhibitors. 3,832,337, Cl. 260-112.500.

O'Neal, George, Jr., to Weltronic Company. Welding control apparatus. 3,832,518, Cl. 219-110.000.

Oneida Packaging Products, Inc.: *See—*
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Onishi, Kazuo; Yamashita, Seizi; and Sato, Mikio, to Hitachi, Ltd. Method of manufacturing a sleeve armature. 3,831,267, Cl. 29-598.000.

Onoda, Yoshimitsu; Saito, Kunio; Okumura, Yosio; Okuyama, Toshiaki; and Otazawa, Nobuaki, to Hitachi, Ltd. Cycloconverter type thyristor motor. 3,832,611, Cl. 318-171.000.

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Opderbeck, Rudolph G.; and Mattern, Horst H., to Wacker Corporation. Pneumatic compacting tool. 3,832,081, Cl. 404-133.000.

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Oram, John Anderson. Multi-beam lighting device. 3,832,539, Cl. 240-41.300.

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Orozco, Hector Mendoza. Bicycle foot brakes. 3,831,716, Cl. 188-24.000.

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Osaka Transformer Co., Ltd.: *See—*
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Osborne, David E.; and Knoerle, Harold M. Self-propelling vehicle. 3,831,977, Cl. 280-229.000.

Osborne, Duncan William, to Automotive Products Limited. Braking systems for vehicles. 3,832,017, Cl. 303-68.000.

Osterloff, Kurt; and Ruhrnschopf, Georg, to Zahnradfabrik Friedrichshafen AG. All-wheel drive for motor vehicles. 3,831,695, Cl. 180-44.00r.

Ostrowsky, Daniel: *See—*
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O'Sullivan, Denis J.; and Melody, David P., to Loctite (Ireland) Limited. Cyanoacrylate adhesive compositions having improved thermal resistance. 3,832,334, Cl. 260-78.50r.

Oswald, Johann: *See—*
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Otis Engineering Corporation: *See—*
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Otrhalek, Joseph V.; and Gansser, Robert E., to BASF Wyandotte Corporation. Method of cleaning vehicles with a thickened acid composition. 3,832,234, Cl. 134-4.000.

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Over, David J., to Aluminum Company of America. Container support in a capping machine. 3,831,344, Cl. 53-329.000.

Overman, Joseph De Witt, to Du Pont de Nemours, E. I., and Company. Hardening-release of crosslinking ions from a complex in an emulsion. 3,832,197, Cl. 106-125.000.

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Ow, Gordon Y. W. Retractable wheel assembly. 3,831,210, Cl. 9-1.00t.

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Owens, Clarence C. Auxiliary rear view mirror system. 3,831,896, Cl. 248-479.000.

Owens-Illinois, Inc.: *See—*
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Owston, William J., to Lord Corporation. Fast curing adhesives. 3,832,274, Cl. 161-183.000.

Oxlade, Roy Ronald, to British Iron and Steel Research Association, The. Rolling mill work roll assemblies. 3,831,242, Cl. 29-148.40d.

Oxy Metal Finishing Corporation: *See—*
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Oy Cyklop AB: *See—*
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Ozawa, Yoshiko: *See—*
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Pacific Clay Products: *See—*
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Packaging Aids, Inc.: *See—*

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Pagella, Elio; and Guerci, Carlo, to Olivetti, Ing., C., & C., S.p.A. Precision measuring apparatus with guides in pneumostatic bearings. 3,831,283, Cl. 33-174.00r.

Palagyi, Tivadar: *See*—
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Pap, Geza, to Allied Chemical Corporation. Removal of sulfur compounds from glycolic and alcoholic compounds by solvent extraction. 3,831,348, Cl. 55-73.000.

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Parcels, Delbert Arthur, to Keen Industries Ltd. Drilling fluid degassing. 3,831,352, Cl. 55-193.000.

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Leibfritz, Kurt W.; and Malinewski, Lester W., 3,831,953.

Parkinson, Dean B.; and Illing, Irvin A., to McCall Corporation. Composition for coating solid surfaces. 3,832,324, Cl. 260-38.000.

Parshall, George W., to Du Pont de Nemours, E. I., and Company. Catalysis by dispersions of metal halides in molten trihalostannate (II) and trihalogermanate (II) salts. 3,832,391, Cl. 260-497.00a.

Parsons, John M., to General Electric Company. Channel indicator means having replaceable indicia. 3,831,549, Cl. 116-124.100.

Parsons, Joseph R.; and Rechter, Harold L., to Chicago Fire Brick Company. Refractory compositions containing diammonium phosphate. 3,832,193, Cl. 106-65.000.

Partek Corporation of Huston: *See*—
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Patel, Hiralal V.; and Liggett, Arthur E., to Weatherhead Company, The. Face type O-ring seal groove and method of producing same. 3,831,951, Cl. 277-170.000.

Patent-Freuhand-Gesellschaft fur Elektrische Gluhlampen mbH: *See*—
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Patrignani, Theo, to Manufacture de Machines du Haut-Rhin. Chain-type jack for handling tensile and compressive loads. 3,831,455, Cl. 74-89.210.

Paul, James T., Jr., to Hercules Incorporated. Process for electrolytic treatment of graphite fibers. 3,832,297, Cl. 204-130.000.

Paul, Kermit, to Fuller Company. Process and apparatus for preheating solid particulate materials. 3,832,128, Cl. 432-17.000.

Pauliukonis, Richard S. Chemical syringe. 3,831,816, Cl. 222-135.000.

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Pavlica, Stanley Ronald; and Weaver, Ernest Paul, to Dresser Industries, Inc. Binder for high alumina refractory brick. 3,832,194, Cl. 106-65.000.

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Brown, Vernon L.; and Pearce, Joseph L., 3,831,676.

Pearson, Howard Brent, to Johns-Manville Corporation. Method of forming gypsum boards with hardening edges. 3,832,250, Cl. 156-39.000.

Pease, J., Norman. Protective shock absorbing device for goalposts. 3,831,941, Cl. 273-55.00r.

Peddinghaus, Carl Ulirich. Piston for a shock absorber. 3,831,626, Cl. 137-493.800.

Pedler, Richard John, to Camelec Limited. Battery terminal. 3,831,271, Cl. 29-628.000.

Peiters, Leon Andre, to Image Analysing Computers Limited. Information selection in image analysis systems employing line scanning. 3,832,485, Cl. 178-6.800.

Pekrul, Ewald, to Westinghouse Bremsen- und Apparatebau GmbH. Two pipe truck trailer brake system with means for applying front and rear trailer brakes upon pull-in-two. 3,832,016, Cl. 303-40.000.

Peli-Can, Inc.: *See*—
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Peller, Henry A., to General Motors Corporation. Steerable tandem axle suspension. 3,831,961, Cl. 280-81.00a.

Pendergast, Lewis A.; and Sorensen, Charles K. Over the shoulder garment carrier bag with hanger hook shield. 3,831,740, Cl. 206-7.00k.

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Perlamn, Morris, to Carbide Form Grinding Inc. Slide fasteners gapping machine. 3,831,474, Cl. 83-143.000.

Perlman, Sheldon E.; and Ion, John C., to Teleflex Incorporated. Apparatus for assembling roller bearing remote control cables. 3,831,249, Cl. 29-201.00r.

Perr, Julius P.; and Muntean, George L., to Cummins Engine Company, Inc. Fuel injector. 3,831,846, Cl. 239-89.000.

Perry, Roger L., to Gillette Company, The. Method of razor blade unit assembly. 3,832,432, Cl. 264-249.000.

Perulfi, John R.: *See*—
Tragesser, Charles W.; and Perulfi, John R., 3,832,482.

Peterson, William Hartin, to Pullman Incorporated. Passenger car switching device. 3,831,527, Cl. 104-130.000.

Petit, Parker H. Respiration monitor. 3,831,586, Cl. 128-2.00r.

Petrilla, Anthony D.; and Smith, Edwin B., to United States of America, Navy, mesne. Noise injection implementation for constant false alarm rate radar. 3,832,710, Cl. 343-5.0sm.

Petsch, Harold A., to Chaska Chemical Company, Inc. Cleaning apparatus. 3,832,069, Cl. 401-289.000.

Petty, Johnny M., to Ford Motor Company. Load cell. 3,831,441, Cl. 73-141.00a.

Pfau, Jean; Marendaz, Georges-Andre; and Rhyner, Heinz, to Ateliers des Charmilles S.A. Pulse generator for EDM machine. 3,832,510, Cl. 219-69.00c.

Pfaue, Johannes, to Patent-Freuhand-Gesellschaft fur Elektrische Gluhlampen mbH. High-pressure metal vapor discharge lamps, particularly sodium vapor lamps with hermetic seal. 3,832,589, Cl. 313-217.000.

Pfizer Inc.: *See*—
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Phares, Lindsey J.; and Gendron, George J., to Raymond International Inc. Driving of hollow tubular members. 3,831,386, Cl. 61-53.540.

Phelps Dodge Industries, Inc.: *See*—
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Phelps, Richard W.; and Tetro, Richard S., to Black Clawson Company, The. Continuous unwinding apparatus for web material. 3,831,876, Cl. 242-58.300.

Philco-Ford Corporation: *See*—
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Phillips, Duane, to Armour and Company. Method and apparatus for shredding cheese. 3,831,866, Cl. 241-63.000.

Phillips, James Curt. Rotary cutter-slitter for high speed bursting apparatus. 3,831,480, Cl. 83-481.000.

Phillips Petroleum Company: *See*—
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Phipps, Dennis, to Cambrian Housewares Limited. Spring balance mechanism. 3,831,688, Cl. 177-229.000.

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Pike, Herbert J., to Stevens, J. P., & Co., Inc. Apparatus and process for air texturizing of yarns. 3,831,363, Cl. 57-34.00b.

Pike, John E.: *See*—
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Pinnow, Kenneth E.; Mehta, J. M.; and Moskowitz, A., to Crucible Inc. Stainless steel. 3,832,244, Cl. 148-37.000.

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Piqua Aircraft Company: *See*—
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Piralli, Louis. Readily releasable clamped spline joint. 3,831,339, Cl. 52-758.00d.

Pirovano, Camillo. Separating apparatus with a drive for the conveyor. 3,831,751, Cl. 209-247.000.

Pisarevskaya, Silvia Izrailevna: *See*—

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Pittenger, Harold M., to Wheatley, Charles, Inc. Gas sampler. 3,831,452, Cl. 73-421.50r.

Pittman, Gary L., to Frank, G. B., Incorporated. Portable imprinter. 3,831,518, Cl. 101-368.000.

Pittman, Gloucester R. Fish lure with fish attracting rattle. 3,831,307, Cl. 43-42.310.

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Campbell, Roger W.; Aukmanis, Edvards B.; and Placko, Milan, 3,831,964.

Planche, Jean, to Schlumberger Technology Corporation. Apparatus for intercoupling well tool sections having electrical and fluid lines. 3,831,443, Cl. 73-152.000.

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Plumb, William H., to National Gypsum Company. Method of coating plastic foam scrap. 3,832,220, Cl. 117-100.00c.

Plunk, Troy E.; and Laramee, Richard J., to Raytheon Company. Radio frequency slot antenna. 3,832,716, Cl. 343-770.000.

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Pogson, John T., to Boeing Company, The. Heat pipe interfaces. 3,831,664, Cl. 165-80.000.

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Pollard, Ernest M., to General Electric Company. Regulating mode selector scheme for an electric power converter. 3,832,620, Cl. 321-5.000.

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Popplewell, Frank William, to Dunlop Limited. Shuttlecocks. 3,831,943, Cl. 273-106.00a.

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Power Wheels Corporation: *See—*
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Praglin, Julius; McKie, James E., Jr.; Curtiss, Alan C.; and Longhenry, David K., to Pfizer Inc. Method and apparatus for testing antibiotic susceptibility. 3,832,532, Cl. 235-151.300.

Praude, Marie-Helene, nee Durupt. Anti-fermentation and neutralizing aqueous solution for the purification of waters, drinks and/or the preservation of liquid or solid foods. 3,832,294, Cl. 252-175.000.

Precision Valve Corporation: *See—*
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Price, Rex. Apparatus for cleaning used bricks. 3,831,577, Cl. 125-26.000.

Process Evaluation and Development Corporation: *See—*
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Proebsting, Robert J., to Texas Instruments, Incorporated. Encoder circuit for reduce pin count for data entry into insulated gate field effect transistor integrated circuits. 3,832,576, Cl. 307-209.000.

Properzi, Ilario. Safety device for rolling mills. 3,831,410, Cl. 72-5.000.

Propper Manufacturing Co., Inc.: *See—*
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Prygrocki, Bohdan, to Remsoh Enterprises Ltd. Carburetion atomizer screen for inlet manifold systems. 3,832,152, Cl. 48-180.00c.

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Ramey, Bobbie Joe; and Moss, Philip Hotchkiss, to Jefferson Chemical Company, Inc. Thixotropic B-component for polyurethane elastomers. 3,832,323, Cl. 260-37.00n.

Ramillon, Rene. Safety toe-end device for ski binding. 3,831,957, Cl. 280-11.35t.

Rampe, John F., to Rampe Research. Continuous feed vibratory finishing machine with discharge rate controlled by operation of tube discharge closure. 3,831,322, Cl. 51-163.000.

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Rawlings, Clifford Max. Interior cap liner. 3,831,230, Cl. 27-19.000.

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Reigler, Paul F.; and Lamoria, Lz F., to Dow Chemical Company, The. Preparation of beryllium hydride etherate. 3,832,407, Cl. 260-615.00b.
Rein, Charles R., to United States of America, Navy. Life support system. 3,831,594, Cl. 128-142.000.
Reinhold, Donald F.; Sletzinger, Meyer; and Firestone, Raymond A., to Merck & Co., Inc. 2-Acetamido-2-(3,4-dioxybenzyl)-3-hydroxypropionitriles. 3,832,377, Cl. 260-465.00d.
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Rejsa, Jack J., to Pillsbury Company, The. Method and apparatus for forming sift proof glued flap seals for cartons. 3,831,342, Cl. 53-47.000.
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Roth, Charles, to Keene Corporation. Lamp mounting for high intensity light fixture. 3,832,540, Cl. 240-51.11r.

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Roush, Maurice D.: *See—*
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Hainaut, Daniel; Toromanoff, Edmond; and Demoute, Jean-Peirre, 3,832,353.

Rowe, Edgar R.; and Terlop, Robert R., to Van Dorn Company. Container sealing lid. 3,831,798, Cl. 215-256.000.

Royal Medical Corporation: *See—*
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Roymoulik, Sunanda K.; and Brown, Kenton J., to International Paper Company. Delignification and bleaching of a cellulose pulp slurry with oxygen. 3,832,276, Cl. 162-65.000.

Royon, Rene; and Thillardon, Georges. Arrangement for aligning fabric material during rolling-up and unrolling operations. 3,831,828, Cl. 226-16.000.

Rubaud, Gerard Rene, to International Ski Service Establishment. Apparatus for renovating skis. 3,832,262, Cl. 156-468.000.

Rubin, David, to United States of America, Navy. Microwave phase shifting apparatus. 3,832,713, Cl. 343-100.0sa.

Rubin, Mae K.: *See—*
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Rubner, Roland: *See—*
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Ruhle, Helmut W., to Esso Research and Engineering Company. Disproportionation process. 3,832,417, Cl. 260-683.00d.

Ruhrnschopf, Georg: *See—*
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Rump, John H.; and Smith, Joseph E., to Monsanto Company. Container which is nestable without sticking. 3,831,745, Cl. 206-520.000.

Runck, Alan H.; and Valeri, Cesare Robert, to United States of America, Navy. Linear gradient generator. 3,832,139, Cl. 23-253.00r.

Russek, Henry Irving. Treatment of angina pectoris with a long-acting vasodilating agent and a beta adrenergic receptor blocking agent. 3,832,470, Cl. 424-330.000.

Russell, Thomas E.: *See—*
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Rutenberg, Morton W.; Tessler, Martin M.; and Kruger, Leo, to National Starch and Chemical Corporation. Inhibited starch products containing labile and non-labile cross-links. 3,832,342, Cl. 260-233.500.

Rutkowski, Edward J.; Dawdy, Jack A.; Hause, Robert F.; and Reinig, Irvine G., II, to National Gypsum Company. Plastic wall trim. 3,831,334, Cl. 52-287.000.

Ryan, James Ernest, to Imperial Chemical Industries Limited. Articles having integral transparent or transluscent panels. 3,832,428, Cl. 264-48.000.

Ryba, Charles J.: *See—*
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Sable, Arthur J., to Sable Photo Works, Inc. Photographic print timer. 3,832,054, Cl. 355-35.000.

Sable Photo Works, Inc.: *See—*
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Sachs, Carrol C. Pneumatic means for production of molded structures. 3,831,898, Cl. 249-65.000.

Saddler, Ivan R.; and Fisher, John A., to Motorola, Inc. Process for manufacturing integrated circuits. 3,832,247, Cl. 148-175.000.

Saeki, Yuzo: *See—*
Sugimoto, Mitsuo; Funaki, Koemon; and Saeki, Yuzo, 3,832,457.

Sahaydak, Miroslaw, to Warner-Lambert Company. Maintenance of flavor integrity in pressed mint assortments. 3,832,473, Cl. 426-175.000.

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Saint-Gobain Industries: *See—*
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Saito, Takashi: *See—*
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Saito, Takeshiro: *See—*
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Sakai, Hiroshi; Yamashita, Hisateru; and Tanaka, Toshihiro, to Kabushiki Kaisha Komatsu Seisakusho. Fully-automatic upsetting machine. 3,831,411, Cl. 72-10.000.

Salvage Oil Systems Ltd.: *See—*
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Sanborn, Ralph D.: *See—*
Bowen, Russell J.; Ford, William B., Jr.; Sanborn, Ralph D.; Sawyer, Winslow A.; Sharp, John R.; Soini, Herbert E.; Lambert, Benjamin A.; and Lull, David B., 3,831,520.

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Sandoz Ltd.: *See—*
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Sanford, Robert J. Multi-purpose real-time holographic polariscope. 3,831,436, Cl. 73-88.00a.

Sanitank Inc.: *See—*
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Sartori, Rolland, to Rhone-Poulenc-Textile. Holding means for yarn winding carrier which is to rotate at high speeds. 3,831,869, Cl. 242-18.0dd.

Sasaki, Tadajiro, to Kabushiki Kaisha Sesaki Seisakusho. Method of and apparatus for spreading cloth. 3,831,472, Cl. 83-92.000.

Sasaki, Toshiro; and Kuroda, Katsuaki, to Kurashiki Boseki Kabushiki Kaisha; a/k/a Kurabo Industries Ltd.). Yarn quality assessment method and apparatus therefor. 3,831,444, Cl. 73-160.000.

Sato, Akira: *See—*
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Sato, Akira; Ikeda, Tadashi; Ogawa, Akira; Shiba, Keisuke; and Hinata, Masanao, to Fuji Photo Film Co., Ltd. Fogged direct positive silver halide emulsion containing a cyanine dye having a Z-aliphatic, chlorine, or hydrogen substituted indole nucleus. 3,83,184, Cl. 96-101.000.
Sato, Isao; and Masai, Tadahisa, to Hitachi, Ltd. Pressure spray type fuel injection nozzle having air discharge openings. 3,831,854, Cl. 239-406.000.
Sato, Kozo; Nakatani, Eizo; and Ichimura, Kiyoshi, to Mitsubishi Rayon Co., Ltd. Process for forming exterior finish coating films for automobile bodies. 3,832,217, Cl. 117-74.000.
Sato, Makoto: *See—*
Akima, Akira; Nishikawa, Masao; Sato, Makoto; Miyahara, Hiromitsu; and Miyakawa, Yoshitaka, 3,832,095.
Sato, Masamichi; and Fukushima, Osamu, to Fuji Photo Film Co., Ltd. Liquid developing apparatus of electrostatic latent image. 3,831,556, Cl. 118-637.000.
Sato, Mikio: *See—*
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Sato, Ryoda. Transformer. 3,832,661, Cl. 336-212.000.
Sato, Ryuichi: *See—*
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Sato, Shinichi. Slide transparency projecting and simultaneous sound reproducing device. 3,832,049, Cl. 353-19.000.
Satomi, Takeo: *See—*
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Satzler, Ronald L.; and Calton, Marion R., to Caterpillar Tractor Company. Cluster gear assembly produced by friction welding. 3,831,459, Cl. 74-439.000.
Saunders, Frederick Charles: *See—*
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Saunders, Frederick Charles; and Smith, Charles, to Dow Corning Limited. Water repellent process and composition. 3,832,203, Cl. 106-287.0sb.
Savall, Vincent: *See—*
Lefur, Jean; Louboutin, Robert; and Savall, Vincent, 3,831,767.
Savall, Vincent; Treille, Pierre; and Bouchard, Jean, to Degremont, Societe Generale d'Epuration et d'Assainissement. Separation of ion exchange resins having different densities. 3,831,750, Cl. 209-160.000.
Saveliev, Vyacheslav Ivancvich: *See—*
Bogdanov, Evdokim Stepanovich; Alexandrov, Alexandr Sergeevich; Schegolevatykh, Vadim Dmitrievich; Saveliev, Vyacheslav Ivancvich; Zakharov, Mikhail Fedorovich; Alexandrov, Jury Nikolaevich; Korsetsky, Gennady Mikhailovich; and Kucher, Arnold Arkadievich, ,831,418.
Sawdo, Richard M.; and Simon, Ivan, to Little, Arthur D., Inc. Apparatus with adjustable period for measuring small deviations from a true horizontal plane. 3,831,287, Cl. 33-344.000.
Sawyer, Winslow A.: *See—*
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Schaff, Ulrich: *See—*
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Schaffer, Howard E.; and Bomboy, Craig L., to Bethlehem Steel Corporation. Method of making plastic composite with wire reinforcements. 3,832,433, Cl. 264-143.000.
Schappel, Joseph W.: *See—*
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Schellin, Winfrid O. E. Methods and device for generating lift. 3,831,884, Cl. 244-12.00c.
Schering Corporation: *See—*
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Scherini, Otto A. Game and playing elements for same. 3,831,945, Cl. 273-148.00r.
Schertler, Paul H.: *See—*
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Schiffmann, Maurine M., to Sperry Rand Corporation. Method for making an information storage device having photochromic areas of 3.5 dichlorosalicylidene 2,4,6 trichloroaniline. 3,831,266, Cl. 29-592.000.
Schipke, Winfried; and Scharf, Friedrich, to Bosch, Robert, GmbH. Agricultural alarm system to warn of impending agricultural pest attacks. 3,831,450, Cl. 73-336.000.
Schirmer, Henry G., to Grace, W. R., & Co. Heat shrinkable, oriented laminated plastic film. 3,832,270, Cl. 161-165.000.
Schirp, Wilhelm: *See—*
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Schlaudroff, Leo M.; and McKinley, Hollace R., to General Electric Company. Winding inserting apparatus. 3,831,641, Cl. 140-92.100.
Schlecht, Karl, to Putzmeister Interholding GmbH. Pump for concrete and other sludging materials. 3,832,097, Cl. 417-516.000.
Schleppnik, Alfred A.; and Wilson, John B., to Monsanto Company. Esters of dialkylallyl alcohols. 3,832,369, Cl. 260-410.90n.
Schlumberger Technology Corporation: *See—*
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Planche, Jean, 3,831,443.
Young, David E., 3,831,632.
Schmidt, Albrecht, to Licentia Patent-Verwaltungs-G.m.b.H. Apparatus for accurately maintaining small underpressures in a tank system which is connected to a gas suction installation. 3,831,619, Cl. 137-206.000.
Schmidt, Gerald W.; Smith, Jay III; Jones, Lawrence T.; and Conroy, Richard F. M., to Identicator Corporation. Fingerprinting apparatus. 3,831,552, Cl. 118-31.500.
Schmidt, Herbert; Weiler, Rolf; and Czich, Erhard, to ITT Industries, Inc. Charging cylinder for a vacuum operated hydrodynamic brake system. 3,831,634, Cl. 138-26.000.
Schmidt, Karin. Apparatus for testing the bending strength of elastic materials. 3,831,438, Cl. 73-100.000.
Schmidt, Peter; and Bejerman, Osvaldo, to Bosch, Robert, GmbH. Method to reduce noxious components in internal combustion engine exhaust gases, and apparatus therefor. 3,831,564, Cl. 123-32.0ae.
Schmitt, Heinz: *See—*
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Schockmel, Robert: *See—*
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Schoenlaub, Robert A. Method of manufacturing zirconium oxide and salts. 3,832,441, Cl. 423-71.000.
Scholz, Hans Jurgen: *See—*
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Schott, Robert E., to Allis-Chalmers Corporation. Hydraulic clutch pressure modulator. 3,831,725, Cl. 192-87.130.
Schroeder, Becky J. Luminescent backing sheet for writing in the dark. 3,832,556, Cl. 250-462.000.
Schubert, Wilfried, to National Advertising Company. Hanging device for display elements on changeable copyboards. 3,831,895, Cl. 248-475.00r.
Schul, Richard J.: *See—*
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Schulte, Thomas L.: *See—*
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Schulz, Gunter W., to Caterpillar Tractor Co. Removable sediment container for rotating fluid system. 3,831,762, Cl. 210-297.000.
Schuman, Ralph H., to Warner and Swasey Company, The. Knitting machine encoder. 3,831,402, Cl. 66-50.00r.
Schuppstuhl, Heinz: *See—*
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Schwam, Stuart A. Fluid truck snubber. 3,831,529, Cl. 105-197.0dw.
Schwartz, Linus G.: *See—*
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Scientific Anglers, Inc.: *See—*
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Sciulli, Joseph Albert; and Lutz, Paul Andrew, to Communications Satellite Corporation. Digital voice switch with an adaptive digitally-controlled threshold. 3,832,491, Cl. 179-1.0vc.

SCM Corporation: *See—*
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Scoggin, John K.: *See—*
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Scott & Fetzer Company, The: *See—*
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Scott, John J., to Norton Company. Aspirating nozzle with quick change liner. 3,831,857, Cl. 239-424.000.

Scott, Oscar Thomas; and Setliff, Bennie Smithers, to Huber, J. M., Corporation. Fluidized bed processing of carbon black. 3,831,747, Cl. 209-11.000.

Scott Paper Company: *See—*
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Scriven, Roger L.: *See—*
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Seidel, Charles S.: *See—*
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Seiden, Myron A., to Polaroid Corporation. Photographic camera having an internally mounted objective lens. 3,832,727, Cl. 354-196.000.

Seifert, Gerd; and Franke, Kurt, to Siemens Aktiengesellschaft. Circuit for a rotary anode X-ray tube. 3,832,553, Cl. 250-406.000.

Seim, Howard N.; and Roebke, Neal E., to Control Data Corporation. Signal multiplexer and demultiplexer. 3,832,494, Cl. 179-15.0ba.

Seitzer, Walter H., to Sun Research and Development Company. Hydrogenation catalyst. 3,832,307, Cl. 252-455.00z.

Sekizawa, Yasuharu: *See—*
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Selivanov, Anatoly Grigorievich; Makachev, Nikolai Ivanovich; Titov, Dmitry Vladimirovich; and Rotenburg, Alexandr Aronovich. Shedding mechanism for looms. 3,831,638, Cl. 139-12.000.

Sello, Stephen B.: *See—*
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Selmin, Allen C.: *See—*
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Seltveit, Arne: *See—*
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Semin, Roy E.: *See—*
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Sendoykas, Jack J.; and Mopherson, Alexander W., to Dover Corporation (De-Sta-Co. Division). Universal clamp with pivoting arm retention means. 3,831,926, Cl. 269-228.000.

Senger, Gerhard Franz-Josef; and Poque, Dionysius Josef, to Uniroyal AG. Belted pneumatic tires. 3,831,656, Cl. 152-361.0fp.

Serota, Samuel: *See—*
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Serritella, Daniel J. Magnetic vehicle bumper. 3,831,847, Cl. 293-1.000.

Setliff, Bennie Smithers: *See—*
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Seto, Yoshihiro, to Fuji Photo Film Co., Ltd. Light-intercepting paper for photographic film. 3,832,218, Cl. 117-76.00p.

Seton, Walter F.: *See—*
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Seymour Oestreicher: *See—*
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Shadbolt, Colin Francis, to Zenith Carburetter Company Limited, The. Carburetors. 3,831,910, Cl. 261-39.00a.

Shaffer, John W.: *See—*
McDonough, Thomas P.; and Shaffer, John W., 3,832,125.

Shaffer, Ronald, to Westinghouse Air Brake Company. Pressure control valve device with a two-position cam actuator for controlling pressure in a vehicle air spring. 3,831,968, Cl. 280-124.00f.

Shaffer, Ronald L., to Beloit Corporation. Internal deckle structure. 3,832,120, Cl. 425-466.000.

Sharp, John R.: *See—*
Bowen, Russell J.; Ford, William B., Jr.; Sanborn, Ralph D.; Sawyer, Winslow A.; Sharp, John R.; Soini, Herbert E.; Lambert, Benjamin A.; and Lull, David B., 3,831,520.

Sharp, Shelby P.; and Sudduth, Lamar F., to Amoco Production Company. Method for dehydration of wet gases. 3,831,346, Cl. 55-32.000.

Shasta Beverages (Division of Consolidated Food Corporation): *See—*
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Shaver, Eugene L.: *See—*
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Shaver, Robert G.: *See—*
Abrams, Edwin F.; and Shaver, Robert G., 3,832,451.

Shaw, Avey. Fishing line attachment. 3,831,308, Cl. 43-43.130.

Shaw, Elliott N., to Polaroid Corporation. Gelatin composition containing a halomethyl ketone of benzyloxycarbonyl phenylalanine. 3,832,198, Cl. 106-135.000.

Shaw, Richard Astourre: *See—*
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Shearer, Herbert N., to Pavement Systems, Inc. Process for making asphalt paving compositions. 3,832,201, Cl. 106-281.000.

Sheets, Richard S., to Powers Manufacturing, Inc. Apparatus for squeeze testing containers. 3,831,437, Cl. 73-94.000.

Sheldon, Donald A.: *See—*
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Shenk, Edwin K.: *See—*
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Shepard, John C.: *See—*
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Sheth, Prafulchandra N.: *See—*
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Shevtsov, Anatoly Ivanovich: *See—*
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Shiba, Keisuke: *See—*
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Shiba, Keisuke; Hinata, Masanao; Sato, Akira; Ogawa, Akira; and Ikeda, Takashi, to Fuji Photo Film Co., Ltd. Silver halide photographic supersensitized emulsions. 3,832,189, Cl. 96-124.000.

Shichida, Hiromichi: *See—*
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Shiller, Jack G., to Seymour Oestreicher. Apparatus for inserting ear rings. 3,831,597, Cl. 128-330.000.

Shimada, Haruo: *See—*
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Shimada, Satoshi, to Sony Corporation. Lenticular rear projection. 3,832,032, Cl. 350-128.000.

Shimizu, Kanryo; Shichida, Hiromichi; and Toyoda, Kenichi, to Fujitsu Limited and Fujitsu Fanuc Limited. Pulse operated surface motor. 3,832,610, Cl. 310-135.000.

Shimizu, Seigo: *See—*
Kawanishi, Kunishisa; Shimizu, Seigo; and Baba, Takio, 3,831,795.

Shimizu, Shigeru, to Hamada Printing Press Mfg., Co., Ltd. Paper feeding apparatus for use in printing machine. 3,831,930, Cl. 271-91.000.

Shimoyashiki, Shigehiro; Makita, Kiyoshi; and Aoki, Naoshi, to Hitachi, Ltd. Apparatus for refining sodium. 3,831,912, Cl. 266-22.000.

Shinano, Takayuki: *See—*
Machi, Sueo; Matui, Yasushi; Kurihara, Hirondo; Hibi, Yoshiharu; Yagi, Toshiaki; Shinano, Takayuki; and Takehisa, Masaaki, 3,832,207.

Shinkle, Jackson J.: *See—*
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Shinohara, Konosuke: *See—*
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Shipley Company, Inc.: *See—*
Gulla, Michael, 3,832,168.

Shipley, Ernest M.: *See—*
Stanton, Vernon W.; and Shipley, Ernest M., 3,832,525.

Shipp, John T.; Hines, Robin H.; Hollinshead, William L.; and Broadbent, Thomas D., to AGA Corporation. Distance measuring device using electro-optical techniques. 3,832,056, Cl. 356-5.000.

Shirek, Daniel E.; Shirek, Robert J.; and Ryba, Charles J. Portable pump. 3,832,093, Cl. 417-231.000.

Shirek, Robert J.: *See—*
Shirek, Daniel E.; Shirek, Robert J.; and Ryba, Charles J., 3,832,093.

Shishido, Tadao: *See—*
Masuda, Takao; Ohkubo, Kinji; and Shishido, Tadao, 3,832,186.

Shobert, Samuel Merle. Method of fabricating an improved plastic bearing. 3,832,255, Cl. 156-148.000.

Shogren, David K., to Xerox Corporation. Scanning apparatus. 3,832,057, Cl. 355-8.000.

Shomura, Takashi: *See—*

Niida, Taro; Inoue, Shigeharu; Tsuruoka, Takashi; Shomura, Takashi; Kondo, Yasumitsu; Ogawa, Yasuaki; Watanabe, Hiroshi; Sekizawa, Yasuharu; Watanabe, Tetsuro; and Igarashi, Hiroshi, 3,832,394.

Shore, Daniel B., to International Harvester Company. Dump valve and forward-reverse drive control employing same. 3,831,721, Cl. 192-4.00c.

Shu, Ping; and Dann, Murray, to American Cyanamid Company. Antibiotic av290-syntan complexes and animal feed supplements. 3,832,462, Cl. 424-123.000.

Siddall, John B.: *See—*
Henrick, Clive A.; and Siddall, John B., 3,832,361.

Siddall, John B., to Zoecon Corporation. Substituted 4-alkylthiobenzoic acid esters. 3,832,385, Cl. 260-470.000.

Siebold, Manfred: *See—*
Beck, Siegfried; and Siebold, Manfred, 3,832,015.

Siegel, Rudolf: *See—*
Dillenburg, Helmut; Honig, Helmut; and Siegel, Rudolf, 3,832,447.

Siegel, Sidney. Drive for sewing machine or the like using magnetic force transmission. 3,831,537, Cl. 112-220.000.

Sielaff, Ulrich: *See—*
Valenta, James D.; Sielaff, Ulrich; and Drabkin, Stephen H., 3,831,595.

Siemens Aktiengesellschaft: *See—*
Engelhard, Dieter; Hofmann, Hermann; Schaff, Ulrich; and Kaiser, Walter, 3,832,602.
Graf, Peter; and Lang, Manfred, 3,832,565.
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Gross, Franz, 3,832,593.
Kleeberg, Wolfgang; Rubner, Roland; and Kuehn, Eberhard, 3,832,187.
Seifert, Gerd; and Franke, Kurt, 3,832,553.
Sohlbrand, Heinrich, 3,832,232.
Stut, Hans, 3,832,626.

Signale & Automatik A.G.: *See—*
Gabus, Jean-Claude, 3,832,570.

Silverman, Daniel. Apparatus for transferring a unique micropattern of microperforations in a first metal layer to an underlying second metal layer. 3,832,547, Cl. 250-319.000.

Simon, Ivan: *See—*
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Singer Company, The: *See—*
Eisenberg, Robert, 3,832,708.
Fahey, Wm. David; and Johnson, Robert W., 3,832,488.
Goetz, Philip J.; and Erk, Kaya, 3,832,712.
Grosvenor, Clifford Ray; Resch, Ronald R.; and Pumm, Paul P., 3,832,571.
Mecklenborg, Richard A., 3,832,046.

Singer Company, The, mesne: *See—*
Hoffman, Jay, 3,831,454.

Singh, Bhupindar; and Swauger, Donald A. Bumper guard and sidewall protector. 3,831,990, Cl. 293-1.000.

Sinham Ram R. P., to Westinghouse Electric Corporation. Transformer having an electrically symmetrical tapped winding. 3,832,660, Cl. 336-150.000.

Sintokogio, Ltd.: *See—*
Hijikata, Itsuo; Kasazaki, Masayoshi; Terada, Hideto; and Inoue, Takao, 3,832,117.

Siregar, John A., to Liggett & Myers Incorporated. Method of feeding cats thawed frozen fish flavored with 5'-nucleotides. 3,832,471, Cl. 426-2.000.

Sitton, Ellis A.: *See—*
Muller, Thomas P.; and Sitton, Ellis A., 3,831,718.

Siwersson, Olle Lennart; and Tell, Karl Gunnar, to Miljoteknik, S. T., AB. Gas cleaners. 3,831,349, Cl. 55-113.000.

Skarin, Carl R.; Dietzel, Kenneth H.; and Gendron, Roger J., to Baker Perkins Inc. Magnetic transfer apparatus. 3,831,780, Cl. 214-6.0ds.

Skierski, Edwin J., to USM Corporation. Self tapping fastener and method and dies for making same. 3,831,415, Cl. 72-88.000.

Skinner, Robert Ivan. Torisonal energy absorber. 3,831,924, Cl. 267-154.000.

Skogsberg, Gunnar. Device for determined batch-wise collection and discharge of articles. 3,831,505, Cl. 93-93.0dp.

Sladowski, Stephen F. X.: *See—*
Majkrzak, Charles P.; and Sladowski, Stephen F. X., 3,831,399.

Sletzinger, Meyer: *See—*
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Slick Corporation, The: *See—*
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SLM Plastics, Inc.: *See—*
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Slovonsky, Idalee; Dagon, Thomas J.; and Bober, Thomas W', to Eastman Kodak Company. Recovery of silver from photographic processing solutions. 3,832,453, Cl. 423-561.000.

Sluijters, Robert: *See—*
Appeldoorn, Jacques W. J.; and Sluijters, Robert, 3,831,904.

Smidth, F. L., & Co.: *See—*
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Smidth, F. L., & Co. A/S: *See—*
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Smith, Anthony J.: *See—*
Hignett, Travis P.; and Smith, Anthony J., 3,832,154.

Smith, Charles: *See—*
Saunders, Frederick Charles; and Smith, Charles, 3,832,203.

Smith, Charles H. Vehicular road sweep device. 3,831,689, Cl. 180-1.00r.

Smith, Clarence R., to Rohm and Haas Company. Reinforced plastic structures containing cured polyester resin. 3,832,268, Cl. 161-162.000.

Smith, Dallas F.; and Arnold, Richard B., to General Electric Company. Apparatus and method for forming shaped insulators. 3,831,255, Cl. 29-25.00e.

Smith, Darrell L.: *See—*
Newton, William D., II; and Smith, Darrell L., 3,831,894.

Smith, Edward Payson; and Nadherny, Rudolph E., to Illinois Railway Equipment Co. Lading tie anchor. 3,831,532, Cl. 105-369.00a.

Smith, Edwin B.: *See—*
Petrilla, Anthony D.; and Smith, Edwin B., 3,832,710.

Smith, Edwin D. Recovery of copper and zinc from automobile scrap. 3,832,162, Cl. 75-63.000.

Smith, Erdis L. Combination camper and boat. 3,831,208, Cl. 9-1.00r.

Smith, Frederick R.; and Schappel, Joseph W., to FMC Corporation. Hydroxylamine treated hemicellulose-containing regenerated cellulose product. 3,832,277, Cl. 162-70.000.

Smith, George B.; and Orlandini, Kent A., to Smith, George B., Laboratories. Preparation of zinc ferrite yellow pigments. 3,832,455, Cl. 423-594.000.

Smith, George B., Laboratories: *See—*
Smith, George B.; and Orlandini, Kent A., 3,832,455.

Smith, Jay III: *See—*
Schmidt, Gerald W.; Smith, Jay III; Jones, Lawrence T.; and Conroy, Richard F. M., 3,831,552.

Smith, Joseph E.: *See—*
Rump, John H.; and Smith, Joseph E., 3,831,745.

Smith, Joseph F. Method and apparatus for applying a false twist to yarns. 3,831,365, Cl. 57-77.400.

Smith, Loren William: *See—*
Cope, Geoffrey Wilton; and Smith, Loren William, 3,831,530.

Smith, Luther A. Emergency escape device for high rise building. 3,831,711, Cl. 192-40.000.

Smith, Ronald E.: *See—*
Presley, C. Travis; and Smith, Ronald E., 3,831,679.

Smith, Stanley Desmond; Wood, Roland Andrew; and Dennis, Richard Benson, to National Research Development Corporation. Spectrometers. 3,832,061, Cl. 356-88.000.

Snedeker, Richard S.: *See—*
Donaldson, Coleman Dup; and Snedeker, Richard S., 3,831,396.

Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See—*
Jullard, Yves, 3,831,637.

Societe Anonyme Automobiles Citroen: *See—*
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Societe Anonyme D. B. A.: *See—*
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Societe Anonyme D.B.A.: *See—*
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Morin, Gerard, 3,831,400.

Societe Anonyme dite; Societelorraine de Laminage Continu: *See—*
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Societe Anonyme dite: Compagnie Francaise de Raffinage: *See—*
Kennel, Michael; and Quiquerez, Joseph, 3,832,200.

Societe Anonyme l'Eclairage Technique: *See—*
Adam, Marie Henri Hubert, 3,832,538.

Societe de Recherches Industrielles S.O.R.I.: *See—*
Majoie, Bernard, 3,832,343.

Societe Financiere Francaise de Licences et Brevets: *See—*
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Societe Generale de Recherche et d'Applications Scientifiques Sogeras: *See—*
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Societe Honeywell Bull (Societe Anonyme): *See—*
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Societe Nationale d'Etude et de Construction: *See—*
Micol, Pierre; and Jacquet, Yves, 3,832,630.

Societe Rhodiaceta: *See—*
Porte, Pierre, 3,831,317.

Soe, Hartvig, to Misomex Aktiebolag. Method and arrangement for stripping text and illustration foils. 3,831,284, Cl. 33-184.500.

Sohlbrand, Heinrich, to Siemens Aktiengesellschaft. Process for producing contact metal layers consisting of aluminum alloy on semiconductor components. 3,832,232, Cl. 117-227.000.

Sohn, David. TLC method and device for detecting the presence of target substances in unknown solutions. 3,832,134, Cl. 23-230.00b.

Soini, Herbert E.: *See—*
Bowen, Russell J.; Ford, William B., Jr.; Sanborn, Ralph D.; Sawyer, Winslow A.; Sharp, John R.; Soini, Herbert E.; Lambert, Benjamin A.; and Lull, David B., 3,831,520.

Sommer, Alfred, to Ceramic Magnetics Inc. Method of making thin film thermistor. 3,831,269, Cl. 29-612.000.

Sommer, Paul: *See—*
Lorch, Eckehard; Sommer, Paul; and Tschirky, Hansjorg, 3,832,140.

Sonneborn, Lambertus Johannes, to Applied Power Inc. Lost motion connection means for hydraulic piston-cylinder device. 3,831,999, Cl. 296-35.00r.

Sony Corporation: *See—*
Ohsawa, Mitsuo, 3,832,627.
Shimada, Satoshi, 3,832,032.

Sorensen, Charles K.: *See—*
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Spanco Yarns, Inc.: *See—*
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Spanjersberg, Arie Adriaan: *See—*
Brok, Wilhelm Fredrik; Spanjersberg, Arie Adriaan; and Van Staveren, Joannes, 3,832,682.

Specht, Theodore R., to Westinghouse Electric Corporation. Transformer internal fault detector. 3,832,600, Cl. 317-14.00d.

Spencer, Bruce G., Jr., to Woodward Governor Company. Motor control apparatus with Geneve-type switch actuating mechanism. 3,832,617, Cl. 318-673.000.

Sperry Rand Corporation: *See—*
Nickel, Frank C.; and Swanson, James R., 3,832,695.
Schiffmann, Maurine M., 3,831,266.
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Sperry Rand Limited: *See—*
Conibear, David Eustace; and Halls, Maurice Vernon, 3,831,286.

Spies, Harvey A., to Maryland Cup Corporation. Apparartus for handling and transporting cylindrical articles and the like. 3,831,732, Cl. 198-20.00r.

Spreckelmeyer, Bernhard W., to Kennecott Copper Corporation. Process for chlorinating copper sulfide minerals. 3,832,440, Cl. 423-40.000.

Springfield, Robert L. Checking device. 3,831,639, Cl. 139-165.000.

Squibb, E. R. & Sons, Inc.: *See—*
Cimarusti, Christopher M., 3,832,366.
Ondetti, Miguel A.; and Pluscec, Josip, 3,832,337.

Srinivas, Srivas Rangachar. System for preparing packed columns and coated capillary tubes useful in gas chromatography. 3,831,555, Cl. 118-506.000.

S.R.M. Hydromekanik Aktiebolag: *See—*
Ahlen, Karl Gustav, 3,831,463.

Stal-Laval Turbin AB: *See—*
Lohonen, Paavo; and Karlsson, Olof, 3,832,087.

Stanadyne, Inc.: *See—*
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Standard Container Company: *See—*
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Standard Oil Company: *See—*
Lazare, Leon; and Jakabhazy, Stephen Z., 3,832,301.

Stanford, Alan G.; and Zutell, George A., to Fairchild Industries, Inc. Mobile aircraft shoring and maintenance device. 3,831,709, Cl. 180-125.000.

Stanley Works, The: *See—*
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Stant Manufacturing Company, Inc.: *See—*
Rodgers, Robert E., 3,831,801.

Stanton, Vernon W.; and Shipley, Ernest M., 20% to Lee, Raymond, Organization, Inc., The. Automatic heating device to prevent freezing of water supply lines. 3,832,525, Cl. 219-301.000.

Stark, Marvin: *See—*
Hutchison, John W.; and Stark, Marvin, 3,831,803.

Starks, Charles M.: *See—*
Hackett, Homer L.; and Starks, Charles M., 3,832,306.

Starr, Laurence Dean: *See—*
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Staten, James P.: *See—*
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Stauffer Chemical Company: *See—*
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Gallagher, Ruth E.; Harrington, Charles L.; and Wachtel, Melvin, 3,832,318.
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Steelcase, Inc.: *See—*
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Stegmeier, William J. Skimmer throat entrance form. 3,831,897, Cl. 249-1.000.

Stein, Wolfgang J.; and Straniti, Salvatore, to Avco Corporation. Plate type heat exchangers. 3,831,674, Cl. 165-166.000.

Steingiser, Samuel: *See—*
Gomez, I. Luis; and Steingiser, Samuel, 3,831,290.

Stella, Joseph A.: *See—*
Batter, John F., Jr.; Mason, Paul B.; Stella, Joseph A.; Thomas, Paul W., Jr.; and Wright, Joseph H., 3,832,048.

Stelma, Gerard N., to Keeler Brass Company. Strike plate/face plate for door latches. 3,831,988, Cl. 292-302.000.

Stenerson, Charles Keith: *See—*
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Stephan, Hans: *See—*
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Stepien, George, Jr.: *See—*
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Stevens, J. P., & Co., Inc.: *See—*
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Tesoro, Giuliana C.; Sello, Stephen B.; and Wurster, Rudolf F., 3,832,132.

Stevens, Peter P., Jr. Child resistant safety closure. 3,831,797, Cl. 215-9.000.

Stewart, John A.: *See—*
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Stewart-Warner Corporation: *See—*
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Stibbe-Monk Developments Limited: *See—*
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Stickler, Charles F. Plumbing connection. 3,831,983, Cl. 285-12.000.

Stiefken, Charles Ernest, to American Smelting and Refining Company. Coating asbestos fiber with aluminum sulfate prior to forming a cement-asbestos slurry from the treated fibers to enhance the filtering characteristics of the slurries. 3,832,280, Cl. 162154.000.

Stillman, Albert H., Jr. Fountain spray system for swimming pools. 3,831,852, Cl. 239-201.000.

Stine, Robert Darrell, Jr.: *See—*
Anderson, Robert L.; and Stine, Robert Darrell, Jr., 3,832,569.

Stith, Joe D.: *See—*
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Stock, Arthur; and Baxter, Alan William, said Stock assor. to Rohm and Haas Company. Production of monochlorodimethyl ether. 3,832,406, Cl. 260-614.00l.

Stocker, Emil; deceased (by Stocker-Boller, Heidi Berta; representative); Schnabel, Ernfred; and Klein, Georg Anton, to Ciba-Geigy AG. Polyazo pigments of the 2-hydroxy-naphthalene-3-carboxylic acidarylide series. 3,832,339, Cl. 260-144.000.

Stocker-Boller, Heidi Berta: *See—*
Stocker, Emil; Schnabel, Ernfred; and Klein, Georg Anton, 3,832,339.

Stoecker, Karl M., to Heinrich Machinery & Tool Mfg. Co., Inc. Vibrator, especially a self propelled reversible tamper. 3,832,080, Cl. 404-133.000.

Stoll, Andre: *See—*
Gadient, Fulvio; Stoll, Andre; and Suess, Rudolf, 3,832,354.

Stone, Jack C.: *See—*
Miller, John E.; Shaver, Eugene L.; and Stone, Jack C., 3,831,879.

Strand, Leif W. Loading device for spherical objects. 3,831,574, Cl. 124-49.000.

Straniti, Salvatore: *See—*
Stein, Wolfgang J.; and Straniti, Salvatore, 3,831,674.

Straughan, Clemens F.; and Schad, Charles A., to CFS Corporation. Method and apparatus for simultaneously applying to an extended cylindrical object a coating and a plastic film wrapping to retain the coating. 3,832,260, Cl. 156-390.000.

Stribling, John Brian; and Booth, Robert Arthur, to Lucas Furnace Developments Limited. Drying and sterilising apparatus. 3,831,288, Cl. 34-1.000.

Strickland, Gordon E., Jr.: *See—*
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Strohmeier, Gerolf: *See—*
Kutzer, Hans-Joachim; Strohmeier, Gerolf; Natter, Bernd; and Sedlatschek, Karl, 3,831,825.

Strojny, Lawrence J.; and Froehling, Paul H., to Johnson Service Company. Status sensing and transmitting circuit. 3,832,688, Cl. 340-147.00r.

Structural Fibers, Inc.: *See—*
Ranallo, Henry U.; and LeBreton, Edward T., 3,832,109.

Stubblefield, Maurice. Animal bridle. 3,831,345, Cl. 54-6.000.

Stubert, John Wesley: *See—*
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Studiengesellschaft Kohle mbH.: *See—*
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Studinger, John H. Mobile self contained pressure sprayer. 3,831,849, Cl. 239-127.000.

Stut, Hans, to Siemens Aktiengesellschaft. Device for electrically heating a semiconductor rod which is simultaneously growing due to a depositing process from the gas phase. 3,832,626, Cl. 323-4.000.

Suda, Kataro, to Yoshi, Ito. Automatic dice shaking device. 3,831,948, Cl. 273-145.00r.

Suda, Michael: *See—*
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Suggitt, Robert M.: *See—*
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Sugimoto, Mitsuo; Funaki, Koemon; and Saeki, Yuzo, to Rikagaku Kenyusho. Ferrite contrast media with metallic oxides. 3,832,457, Cl. 424-4.000.

Suld, George, to Sun Research and Development Company. Hydrocracked lubes stabilized with aromatic azo compounds. 3,832,304, Cl. 252-51.50a.

Sullivan, Bernard J.; and Baxter, David G., to Xerox Corporation. Drum track detector. 3,832,065, Cl. 356-210.000.

Sumitomo Chemical Company, Limited: *See—*
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Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, 3,832,351.

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Sumitomo Chemical Company, Ltd., mesne: *See—*
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Sun Research and Development Company: *See—*
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Sutton, William Heald; Evans, Thomas Ernest; and Hart, Anthony Christopher, to International Nickel Company, Inc., The. Catalytic cathodic hardening of oxide films. 3,832,292, Cl. 204-56.00r.

Suzuki, Akira, to Aisin Seiki Kabushiki Kaisha. Power steering mechanism. 3,831,700, Cl. 180-79.20r.

Suzuki, Hideo; Kobayashi, Harumi; Ozawa, Yoshiko; and Kamibayashi, Akira, to Agency of Industrial Science & Technology. Method for manufacture of alpha-galactosidase by microorganisms. 3,832,284, Cl. 195-11.000.

Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Hazard warning signal device for use in automotive vehicle. 3,832,680, Cl. 340-81.00r.

Suzuki, Masayuki: *See—*
Ikeda, Toshimichi; Kawauchi, Masataka; Matsuzaki, Atsushi; and Suzuki, Masayuki, 3,831,683.

Suzuki, Migaku: *See—*
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Suzuki, Ryoshu: *See—*
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Svanstrom, Elis Kjell Ake, to Rederiaktiebolaget Nordstjernan. Method of producing refractory metals and refractory metal compounds in powder form. 3,832,157, Cl. 75-.5bb.

Sviridenko, Valentina Yakovlevna: *See—*
Dubovsky, Boris Grigorievich; Bogatyrev, Viktor Konstantinovich; Vladykov, German Matveevich; and Sviridenko, Valentina Yakovlevna, 3,832,563.

Swanson, Allen K., to Hamton Engineering Associates, Inc. Projector dissolve control. 3,832,051, Cl. 353-86.000.

Swanson, James R.: *See—*
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Swauger, Donald A.: *See—*
Singh, Bhupindar; and Swauger, Donald A., 3,831,990.

Swearingen, Judson S. Lubricating and sealing system for a rotary power plant. 3,831,381, Cl. 60-657.000.

SWF-Spezialfabrik fur Autozubehor Gustav Rau GmbH: *See—*
Deutscher, Hans-Christian; and Bauer, Kurt, 3,831,219.

Syndyne Corporation: *See—*
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Synthelabo: *See—*
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Syracuse University Research Corporation: *See—*
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Syrop, Leroy J., to Del Mar Engineering Laboratories. Apparatus for processing hexanitrostilbene. 3,832,142, Cl. 23-272.650.

Szabo, Andras I.; and Diaz, Ricardo A., to Westinghouse Electric Corporation. Common mode noise suppressing circuit adjustment sequence. 3,832,646, Cl. 330-30.00d.

Szeverenyi, Nikolaus A., to GTE Sylvania Incorporated. Latching means for sensing apparatus. 3,832,702, Cl. 340-244.00r.

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Tacke, William H.; Ormiston, Robert B.; and McKay, Robert H., to Steelcase, Inc. Panel system. 3,831,330, Cl. 52-220.000.

Taggart, Robert B., Jr. Dish reflector for a high gain antenna. 3,832,717, Cl. 343-840.000.

Takahashi, Kenryu. Flexible blade rotary pump. 3,832,105, Cl. 418-154.000.

Takahashi, Tomowaki, to Nippon Kogaku, K.K. Wide angle, retrofocus-type photo-taking lens. 3,832,035, Cl. 350-189.000.

Takanashi, Akihiro; and Hashimoto, Seiya, to Hitachi, Ltd. Intermittent feed mechanism. 3,831,458, Cl. 74-436.000.

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Takeuchi, Yasuhisa, to Nissan Motor Company, Limited. System to prevent drunken driving. 3,831,707, Cl. 180-99.000.

Takiguchi, Koichi, to Fuji Xerox Co., Ltd. Heating unit for copying machine. 3,832,524, Cl. 219-216.000.

Talbot, James R.: *See—*
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Tamada, Kazumi; and Takase, Tadayoshi, to Kabushiki Kaisha Pinnai Seisakusho. Forced hot air type cooking oven. 3,831,579, Cl. 126-21.00a.

Tamura, Hiroshi: *See—*
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Tamura, Masahiko: *See—*
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Tamura, Shigeru, to Mura, George J. Rail fastening device. 3,831,842, Cl. 238-349.000.

Tanaka, Akira, to Gakken Co., Ltd. Method and means for reproducing a mirror-image record of a subject copy in a facsimile master-making machine. 3,832,484, Cl. 178-6.60b.

Tanaka, Katsutoshi: *See—*
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Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, to Sumitomo Chemical Company, Limited. Aromatic imidocarbonates. 3,832,351, Cl. 260-294.80e.

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Taylor, Derek: *See—*
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Taylor, Don A. Method for forming hollow articles. 3,832,437, Cl. 264-248.000.

Taylor, Edward C.; and McKillop, Alexander. Chemical processes using organothallium compounds. 3,832,381, Cl. 260-468.00k.

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Themelis, Nicholas John; and McKerrow, George Clement, to Noranda Mines Limited. Process for continuous smelting and converting of copper concentrates. 3,832,163, Cl. 75-74.000.

Thigpen, James L., to CRC-Crose International, Inc. Earth working apparatus. 3,831,684, Cl. 172-248.000.

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Thomas, Alfred William, to Deutsche Bendix Aurustungs GmbH. Brake booster. 3,831,491, Cl. 91-391.000.

Thomas, Eugene P.; Cimildora, Henry F.; and Morin, James A., to CGR Medical Corporation. Cassette load and eject mechanism for spot-film apparatus. 3,832,559, Cl. 250-468.000.

Thomas, Leonard L. Garment hanger. 3,831,826, Cl. 223-88.000.

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Thomas, Thomas G., to General Motors Corporation. Multi-piece intake manifold. 3,831,566, Cl. 123-52.0mv.

Thomas, William B.; and Betts, Robert E., to United States of America, Army. Electroexplosive device. 3,831,523, Cl. 102-28.00r.

Thompson, Robert M., to Sun Research and Development Company. Polyamide polymer of diaminomethyl adamantane and dicarboxylic acid. 3,832,332, Cl. 260-78.00r.

Thomson-CSF: *See—*
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Vadas, Leslie, to FMC Corporation. Table top pineapple slicing and chunking. 3,831,469, Cl. 83-39.000.
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Van Grinsven, Petrus F. A., to Shell Oil Company. Process for the removal of cyclopentadiene from hydrocarbon mixtures. 3,832,416, Cl. 260-861.50r.

Van Herten, Jozef Marie, to Oce-Van der Grinten N.V. Method and apparatus for folding sheets such as drawings. 3,831,927, Cl. 270-79.000.

Van Heyningen, Arent H.; and Engelhardt, Bjorn H., to Raytheon Company. Minimal dissipation power controller. 3,832,643, Cl. 330-15.000.

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van Zon, Cornelis, to Industriele Onderneming Wavin N.V. Method for manufacturing a transversely or helically grooved plastic tube with a smooth inner wall. 3,832,259, Cl. 156-293.000.

Vanderklaauw, Peter M., to Research Corporation. Method of erecting a multi-story building and apparatus therefor. 3,831,902, Cl. 254-105.000.

Vanheertum, Johannes Josephus: *See*—
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Vogt, Kuno J. Telephone attachment for limiting dialing. 3,832,497, Cl. 179-90.00d.

von Mehren, Juan Puertas, to Elementos Para Traccion y Excavaction, S.A. Device for fixing teeth to tooth holders in earth-moving machines. 3,832,077, Cl. 403-379.000.

Vornberger, Walter, to International Shoe Machine Corporation. Method and machine for cement lasting. 3,831,216, Cl. 12-145.000.

Vornberger, Walter, to International Shoe Machine Corporation. Roughing machine with roughing tool sharpening mechanism. 3,831,405, Cl. 69-6.500.

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Wallack, Stanley, to Oceanetics, Inc. Gas detector unit. 3,832,548, Cl. 250-343.000.

Wallard, John J. Egg boiler or cooker. 3,831,508, Cl. 99-440.000.

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Weissenburg, Per Torsten. Tower type heat exchangers for heat interchange between gases heated to different temperatures. 3,831,668, Cl. 165-107.000.
Weistrop, Elizabeth N. Multi-figure zipper bag toy. 3,831,316, Cl. 46-153.000.
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Wong, Franklin Victor. Piston actuated switch with screw threads on piston and housing. 3,832,505, Cl. 200-158.000.
Woo, Ji Yah, to Bendix Corporation, The. Tubular push rod means for servomotor. 3,831,489, Cl. 91-32.000.
Wood, Roland Andrew: *See—*
Smith, Stanley Desmond; Wood, Roland Andrew; and Dennis, Richard Benson, 3,832,061.
Woods, Joe W.; and Yosmali, Krikor, to International Business Machines Corporation. Ink jet printing apparaus with overrun of printhead to insure better visibility. 3,831,728, Cl. 197-1.00r.
Woods, Richard E., to Franklin Electric E., Inc. Electrical timing circuit for controlling energization of a load. 3,832,612, Cl. 318-221.00e.
Woodward Governor Company: *See—*
Barrett, William J.; and Green, Harold, 3,832,609.
Spencer, Bruce G., Jr., 3,832,617.
Woody, Albert L.; Audiffred, Sidney J.; and Steury, Howard C., to Caterpillar Tractor. Drive train with controlled slipping clutch. 3,831,726, Cl. 192-103.0fa.
Worman, Roger A.: *See—*
Nieman, John R.; and Worman, Roger A., 3,831,662.
Wresch, Herman D., to MacLean-Fogg Lock Nut Co. Retainer key for pedestal side frames. 3,831,531, Cl. 105-221.00k.
Wrhen, Wilmer C.: *See—*
Anderton, John J.; Dudzic, Max S.; and Wrhen, Wilmer C., 3,831,661.
Wright, Beryle W., to Mill Power Engineering & Manufacturing Co. Scrap cutter machine. 3,831,477, Cl. 83-349.000.
Wright, Harold A., to Arco Polymers, Inc. Process for making foamed styrene polymers photodegradable. 3,832,312, Cl. 260-2.5hb.
Wright, Joseph H.: *See—*
Batter, John F., Jr.; Mason, Paul B.; Stella, Joseph A.; Thomas, Paul W., Jr.; and Wright, Joseph H., 3,832,048.
Wright, Luther M.; and Epps, William A., to Eastman Kodak Company. Print cutting mechanism for bordered and borderless prints. 3,831,478, Cl. 83-368.000.
Wrightway Mfg. Co.: *See—*
Gullaksen, Gilbert V.; and Jatho, George W., 3,831,860.
Wu, Shu-Yau; and Francombe, Maurice Hubert, westinghouse Electric Corporation. Ferroelectric memory device. 3,832,700, Cl. 340-173.200.
Wueger, Karl W., to Crompton & Knowles Corporation. Pneumatic loom. 3,831,640, Cl. 139-125.000.
Wurster, Rudolf F.: *See—*
Tesoro, Giuliana C.; Sello, Stephen B.; and Wurster, Rudolf F., 3,832,132.
Wyard Industries, Inc.: *See—*
Howard, Richard W.; and Weier, Roman J., 3,831,733.
Wyss, Escher, GmbH: *See—*
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Kahmann, Albrecht, 3,831,868.
Xerox Corporation: *See—*
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Fantozzi, Louis J., 3,831,933.
Goel, Narendra S.; and Fletcher, Gerald M., 3,832,053.
Hamaker, Ralph A., 3,832,055.
Shogren, David K., 3,832,057.
Sullivan, Bernard J.; and Baxter, David G., 3,832,065.
Theitu, Raghulinga R., 3,831,553.
Xonics, Inc.: *See—*
Morsell, Arthur Lee; and Moise, Norton L., 3,832,546.
Yagi, Toshiaki: *See—*
Machi, Sueo; Matui, Yasushi; Kurihara, Hirondo; Hibi, Yoshiharu; Yagi, Toshiaki; Shinano, Takayuki; and Takehisa, Masaaki, 3,832,207.
Yakibjuk, Ivan E.: *See—*
Byzov, Gennady V.; Valdman, Ilya V.; Mazurovsky, Boris Y.; and Yakibjuk, Ivan E., 3,831,420.
Yamada, Tadashi: *See—*
Higuchi, Masaru; Yamada, Tadashi; and Suzuki, Ryoshu, 3,832,357.
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Yamada, Tateo: *See—*
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Yamaguchi, Haruki: *See—*
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Yamamoto, Fumihiko: *See—*
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Yamamoto, Hisao: *See—*
Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsuikeda, Mitsuhiro; Dume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, 3,832,344.
Yamamoto, Kazuo: *See—*
Okada, Hideya; Shimada, Haruo; and Yamamoto, Kazuo, 3,832,166.
Yamamoto, Sigeo: *See—*
Tanaka, Shizuya; Ozaki, Toshiaki; Mine, Akihiko; Tanaka, Katsutoshi; Yamamoto, Sigeo; Ooishi, Tadashi; Hino, Naganori; and Satomi, Takeo, 3,832,351.
Yamamoto, Takashi; Yasukouchi, Kenichi; and Sato, Ryuichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Device for early detection of rupture of the pressure part of a boiler. 3,831,561, Cl. 122-379.000.
Yamamoto, Takeshi: *See—*
Mori, Keisuke; Yamada, Takehiro; Nakamoto, Katsumi; Onaka, Hirosi; Yamamoto, Takeshi; and Kato, Taizo, 3,831,918.
Yamanouchi, Teruo: *See—*
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Yamaoka, Kojiro; Azuma, Toshiro; and Fujisaki, Koichiro, to Kanzaki Kokyukoki Mfg. Co., Ltd. Tractor driving and steering arrangement. 3,831,690, Cl. 180-6.660.
Yamashita, Hisateru: *See—*
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Yamashita, Seizi: *See—*
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Yamauro, Isao; and Tamura, Masahiko, to Pioneer Electronic Corporation. High molecular weight, thin film piezoelectric transducers. 3,832,580, Cl. 310-9.500.

Yamazaki, Eiichi, to Hitachi, Ltd. Mask electrode support for color picture tube. 3,832,592, Cl. 313-404.000.

Yamazaki, Haruo; Akutsu, Hidezo; and Okamoto, Takio, to Matsushita Electronics Corporation. High pressure metal-vapour discharge lamp having alumina tube with thickened end portions sealed by alumina disks. 3,832,590, Cl. 313-218.000.

Yasuda, Shigeo: *See—*
Kaida, Masaaki; and Yasuda, Shigeo, 3,832,681.

Yasukouchi, Kenichi: *See—*
Yamamoto, Takashi; Yasukouchi, Kenichi; and Sato, Ryuichi, 3,831,561.

Yeakey, Ernest Leon, to Jefferson Chemical Company, Inc. Tertiary polyoxyalkylenepolyamines. 3,832,402, Cl. 260-584.00b.

Yokooi, Atsusi: *See—*
Marui, Takao; and Yokooi, Atsusi, 3,832,238.

Yokoyama, Takeo, to Mitsumi Electric Company, Limited. Ultrasonic delay line. 3,832,655, Cl. 333-30.00r.

Yonce, Everett R. Portable tool container or the like. 3,831,805, Cl. 220-94.00a.

Yonekura, Yasushi: *See—*
Akamatsu, Kiyoshi; Maruta, Masayasu; and Yonekura, Yasushi, 3,832,177.

Yoshi, Ito: *See—*
Suda, Kataro, 3,831,948.

Yoshida, Minoru, to Japan Steel Works Ltd. Cutter shaft device in a pelletizing apparatus for synthetic resins. 3,832,114, Cl. 425-313.000.

Yosmali, Krikor: *See—*
Woods, Joe W.; and Yosmali, Krikor, 3,831,728.

Yost, Betty Jane, to Ledex, Inc. Electromagnetically operated latch. 3,831,486, Cl. 89-1.50d.

Young, David E., to Schlumberger Technology Corporation. Remote controlled safety valve. 3,831,632, Cl. 137-624.130.

Young, Michael R., to Eaton Corporation. Overload protection device for counterbalance vehicles. 3,831,492, Cl. 91-411.00r.

Yu, Lin S.: *See—*
Nesslage, Donald J.; and Yu, Lin S., 3,832,241.

Yuasa Battery Company Limited: *See—*
Marui, Takao; and Yokooi, Atsusi, 3,832,238.

Yum, Su Il; Buckles, Richard G.; and Barrer, Richard M., to ALZA Corporation. Fluid flow control. 3,831,600, Cl. 128-214.00r.

Zahnradfabrik Friedrichshafen AG: *See—*
Osterloff, Kurt; and Ruhrnschopf, Georg, 3,831,695.

Zaiser, Wolfgang, to Daimler-Benz Aktiengesellschaft. Planetary gear change-speed transmissions, especially for motor vehicles. 3,831,464, Cl. 74-763.000.

Zak, Grigory Iosifovich: *See—*
Anikanov, Nikolai Ivanovich; Grachev, Leonid Pavlovich; Goltsman, Samuil Aronovich; Zak, Grigory Iosifovich; Oleinik, Alexandr Ivanovich; Radutsky, Grigory Avramovich; Kheifets, Rafail Efimovich; and Baburin, Evgeny Arkadievich, 3,831,781.

Zakharov, Mikhail Fedorovich: *See—*
Bogdanov, Evdokim Stepanovich; Alexandrov, Alexandr Sergeevich; Schegolevatykh, Vadim Dmitrievich; Saveliev, Vyacheslav Ivancvich; Zakharov, Mikhail Fedorovich; Alexandrov, Jury Nikolaevich; Korsetsky, Gennady Mikhailovich; and Kucher, Arnold Arkadievich, ,831,418.

Zeeh, Bernd: *See—*
Koenig, Karl-Heinz; Kolbinger, Rudolf; Zeeh, Bernd; and Fischer, Adolf, 3,832,389.

Zenith Carburetter Company Limited, The: *See—*
Shadbolt, Colin Francis, 3,831,910.

Zenith Radio Corporation: *See—*
Cook, Charles A.; and Hajduk, Thaddeus J., 3,832,211.
Jirka, Howard F., 3,832,483.

Zentar, Richard L., to T-R Wire Co. Retentive hanger bracket. 3,831,893, Cl. 248-223.000.

Zimmerman, Dallas D.: *See—*
Endres, Leland S.; Gehlhoff, Leo F.; and Zimmerman, Dallas D., 3,832,409.

Zimmermann, Robert E., to Koppers Company, Inc. Metallurgical furnace. 3,831,914, Cl. 266-25.000.

Zirlin, Amnon Dov, to Centre for Industrial Research (CIR) Ltd. Prevention of crystallization of sparingly soluble flavonoids in food systems. 3,832,475, Cl. 426-365.000.

Zitelli, William E.: *See—*
Carlson, Norman R.; Zitelli, William E.; and Burtnyk, Victor, 3,832,534.

Zoecon Corporation: *See—*
Henrick, Clive A.; and Siddall, John B., 3,832,361.
Siddall, John B., 3,832,385.

Zuege, Charles F., to Allis-Chalmers Corporation. Isolated vehicle control module. 3,831,704, Cl. 180-89.00r.

Zundel, Arthur P., to National Can Corporation. Safety aerosol can. 3,831,822, Cl. 222-397.000.

Zutell, George A.: *See—*
Stanford, Alan G.; and Zutell, George A., 3,831,709.

1/2 to Durigan, Eugene S.: *See—*
Walton, Nelson R.; and 1/2 to Durigan, Eugene S., 3,831,960.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF AUGUST, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AMF, Inc.: *See*—
Holman, Rudolph G. Re. 28,133.

Bell Telephone Laboratories, Inc.: *See*—
Bergh, Arpad A., Paola, and Saul. Re. 28,140.

Bergh, Arpad A., C. R. Paola, and R. H. Saul, to Bell Telephone Laboratories, Inc. Semiconductor epitaxial growth from solution. Re. 28,140, 8–27–74, Cl. 148—172.

Bradshaw, Christopher P. C.: *See*—
Turner, Leonard, Bradshaw, and Howman. Re. 28,137.

British Petroleum Co. Ltd., The: *See*—
Turner, Leonard, Bradshaw, and Howman. Re. 28,137.

Davis, Ariel R. Cordless electric cross-connect panel with improved movable contact assembly. Re. 28,134, 8–27–74, Cl. 200—1.

Freeman, Kenneth G., and M. C. French, to U.S. Philips Corp. Circuit arrangement including a colour display cathode-ray tube of the index type. Re. 28,132, 8–27–74, Cl. D178—5.

French, Michael C.: *See*—
Freeman, Kenneth G., and French. Re. 28,132.

Gore, Graves T., to Riegel Textile Corp. Apparatus for successively forming disposable diapers. Re. 28,139, 8–27–74, Cl. 156—467.

Helsley, Grover C.: *See*—
Lunsford, Carl D., Helsley, and Richman. Re. 28,141.

Holman, Rudolph G., to AMF, Inc. Method of winding a ball. Re. 28,133, 8–27–74, Cl. 242—3.

Hull, Charles A. Solid smooth-surface article washing device. Re. 28,135, 8–27–74, Cl. 134—58.

Kasecky, Joseph J.: *See*—
Harbaugh, Samuel S., Kasecky, and Murtland. Re. 28,149.

Lunsford, Carl D., G. C. Helsley, and J. A. Richman, Jr., to A. H. Robins, Co., Inc. Composition containing 3-di-substituted methylene pyrrolidines and methods of treating depression. Re. 28,141, 8–27–74. Cl. 424—274.

Meckler, Gershon, to National Service Industries, Inc., Comfort conditioning system. Re. 28,136, 8–27–74, Cl. 165—39.

Murtland, James B., Jr.: *See*—
Harbaugh, Samuel S., Kasecky, and Murtland. Re. 28,149.

National Service Industries, Inc.: *See*—
Meckler, Gershon. Re. 28,136.

O'Neal, Cothburn M., to Riverside Press, Inc. Voting machine with punch card attachment. Re. 28,138, 8–27–74, Cl. 235—54.

Paola, Carl R.: *See*—
Bergh, Arpad A., Paola, and Saul. Re. 28,140.

Richman, John A., Jr.: *See*—
Lunsford, Carl D., Helsley, and Richman. Re. 28,141.

Riegel Textile Corp.: *See*—
Gore, Graves T. Re. 28,139.

Riverside Press Inc.: *See*—
O'Neal, Cothburn M. Re. 28,138.

Robins, A. H., Co., Inc.: *See*—
Lunsford, Carl D., Helsley, and Richman. Re. 28,141.

Saul, Robert H.: *See*—
Bergh, Arpad A., Paola, and Saul. Re. 28,140.

Turner, Leonard, C. P. C. Bradshaw, and E. J. Howman, to The British Petroleum Co., Ltd. Olefin preparation. Re. 28,137, 8–27–74, Cl. 260—683.

U.S. Philips Corp.: *See*—
Freeman, Kenneth G., and French. Re. 28,132.

LIST OF PLANT PATENTEES

Barberet, Alexandre, and H. Blanc, to Laboratoire de Physiologie Vegetale de la Londe. Carnation plant. 3,602, 8–27–74, Cl. 72.

Blanc, Henri: *See*—
Barberet, Alexandre, and Blanc. 3,602.

Grasso, Louis. Carnation plant. 3,600, 8–27–74, Cl. 70.

Griggs, William H., and B. T. Iwakiri to The Regents of the University of Calif. Pear tree. 3,599, 8–27–74, Cl. 36.

Iwakiri, Ben T.: *See*—
Griggs, William H., and Iwakiri. 3,599.

Laboratoire de Physiologie Vegetale de la Londe: *See*—
Barberet, Alexandre, and Blanc. 3,602.

Moore, Ralph S. Miniature rose plant. 3,601, 8–27–74, Cl. 7.

Sherrill, Lewis B. Peach tree. 3,603, 8–27–74, Cl. 43.

University of Calif., The Regents of the: *See*—
Griggs, William H., and Iwakiri. 3,599.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Sears, Harrison W. 232,527.

Abend, Chester J., J. J. Bienkowski, and J. E. Jolliffe, to SMC Corp. Typewriter. 232,583, 8–27–74, Cl. D64—11.

Adams, J. Henry. Game board. 232,569, 8–27–74, Cl. D34—5.

Ajax Hardware Corp.: *See*—
Zagaroli, David P. 232,517.

Archinal, Harry B. Table. 232,504, 8–27–74, D6—177.

Artz, Richard M. Lens cluster unit for photoprinting. 232,582, 8–27–74, Cl. D61—1.

Barbaro, Ronald D.: *See*—
Geneteili, Emil J., Barbaro, and Yeh. 232,546.

Barry Wright Corp.: *See*—
Wright, David M. 232,508.

Bartley, Keith D., F. A. Dewhirst, D. M. Genaro, and J. N. McGarvey. Public telephone support. 232,541, 8–27–74, Cl. D13—1.1.

Bell Telephone Laboratories, Inc.: *See*—
Doyle, Francis S., Genaro, Paas, and Prince. 232,562.

Bendix Corp., The: *See*—
Michel, Donald E., and McKeown. 232,556.
Michel, Donald E., and McKeown. 232,557.

Benjamin, E. Burton, to Master Appliance Corp. Heat gun. 232 554, 8–27–74, Cl. D23—162.

Berkeley Pump Co.: *See*—
Rhoda, Ralph A. 232,600.

Bienkowski, James J.: *See*—
Abend, Chester J., Bienkowski, and Jolliffe. 232,583.

Bienkowski, James J., and P. D. Younge, to SCM Corp. Typewriter. 232,585, 8–27–74, Cl. D64—11.

Boktys, Algimantas K.: *See*—
Schefke, John T., and Boktys. 232,587.

Brown, Dwight C. Golf tee holder and driver head protector. 232,568, 8–27–74, Cl. D34—5.

Brunswick Corp., The: *See*—
Miller, Earl E. 232,548.

Busse, Eileen F. Hooded cape. 232,497, 8–27–74, Cl. D2—179.

Canfield, A. J., Co.: *See*—
Canfield, Alan B. 232,520.

Canfield, Alan B., to A. J. Canfield, Co. Bottle. 232,520, 8–27–74, Cl. D9—96.

Cannon Mills Co.: *See*—
Scherer, Nancy A. 232,509.

Capehart Corp.: *See*—
Levine, Robert. 232,503.

Caveney, Jack E., to Panduit Corp. Combined packaging and display container. 232,525, 8–27–74, Cl. D9—224.

Cheek, Joel A., to Universal Enterprises, Inc. Combined phonograph record and tape cartridge storage rack. 232,507, 8–27–74, Cl. D6—189.

Chemineer, Inc.: *See*—
Fenic, John C., Kime, Raridan, and Viemeister. 232,581.

Cianciolo, Frank P. Scarf. 232,498, 8–27–74, Cl. D2—358.

Coffin, Stewart T. Spheral polyhedral interlocking puzzle. 232,571, 8–27–74, Cl. D34—15.

Cotta, Joe E.: *See*—
McGreevy, Helen N., and Cotta. 232,500.

Daniel, Eugene T., to Monogram Models, Inc. Stylized model power shovel. 232,573, 8–27–74, Cl. D34—15.

Deniega, Jose C., to Stop-Motion Devices Corp. Stop motion. 232,599, 8–27–74, D02—15.

Dentaply Research & Development Corp.: *See*—
Webb, Ronald C. 232,555.

Dewhirst, Fred A.: *See*—
Bartley, Keith D., Dewhirst, Genaro, and McGarvey. 232,541.

Dikoff, Joseph K. Check writer. 232,586, 8–27–74, Cl. D64—11.

Doyle, Francis S., D. M. Genaro, T. J. Paas, and T. B. Prince, to Bell Telephone Laboratories, Inc. Telephone stand. 232,562. 8–27–74, Cl. D26—14.

Eastman Kodak Co.: *See*—
McClare, Andrew V. 232,559.
Sias, James H. 232,597.

Eaton Corp.: *See*—
Spencer, Clifford A. 232,566.

Eriksen, David: *See*—
Heiser, Milton L., and Eriksen. 232,511.

Family Products, Inc.: *See*—
Roche, David E. 232,521.

Fenic, John G., D. L. Kime, W. C. Raridan, and R. C. Viemeister, to Chemineer, Inc. Right angle drive and pedestal. 232,581, 8–27–74, Cl. D55—1.

Fingerhut Corp.: *See*—
Meiser, Milton L., and Eriksen. 232,511.

Formica Corp.: *See*—
Willard, Jack A. 232,595.

Friesen, Wilmer J., and F. A. Hulet, to M. W. Hartman, Mfg. Co., Inc. Jacket for foundry sand mold. 232,577, 8–27–74, Cl. D54—8.

Fushihara, Tomotsuro, to Sandeigurafe Co., Ltd. Water processing appliance. 232,550, 8–27–74, Cl. D23—3.

Genaro, Donald M.: *See*—
Bartley, Keith D., Dewhirst, Genaro, and McGarvey. 232,541.
Doyle, Francis S., Genaro, Paas, and Prince. 232,562.

Genetelli, Emil J., R. D. Barbaro, and J. T. Yeh, to Princeton Aqua Science. Waste water analyzer unit. 232,546, 8–27–74, Cl. D16—2.

Golden, Steven T. Golfer's training mat. 232,567, 8–27–74, Cl. D34—5.

Grover, Douglas U. In line filter. 232,551, 8–27–74, Cl. D23—4.

Haberman, Thomas A., to Minnesota Mining and Mfg. Co. Electrosurgical handle. 232,591, 8–27–74, Cl. D83—12.

Hakanson, Ulf F. L., to Skogsagarnas Industrie AB. Carrying tray for beverages cartons or the like. 232,522, 8–27–74, Cl. D9—177.

Hartman, M. W., Mfg. Co., Inc.: *See*—
Friesen, Wilmer J., and Hulet. 232,577.

Hartz Mountain Corp., The: *See*—
Kissin, Claud W. 232,564.

Heiser, Milton L., and D. Eriksen, to Fingerhut Corp. Cover for cooking pans or the like. 232,511, 8–27–74, Cl. D7—131.

Hermanson, Terry, to Mr. Christmas Inc. Adapter for incandescent light bulb. 232,558, 8–27–74, Cl. D26—1.

Hilden, Heinz W., to Telesco Brophey Ltd. Umbrella handle. 232,598, 8–27–74, Cl. D88—3.

Hinnenkamp, Arthur J., to Medical Plastics, Inc. Electrocardiogram plate electrode. 232,589, 8–27–74, Cl. D83—1.

Hulet, Frank A.: *See*—
Friesen, Wilmer J., and Hulet. 232,577.

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Kelbish, Edward D. Preassembled modular housing structure. 232,542, 8–27–74, Cl. D13—1.2.

Kelbish, Edward D. Preassembled modular housing structure. 232,543, 8–27–74, Cl. D13—1.

Kelbish, Edward D. Preassembled modular housing structure. 232,544, 8–27–74, Cl. D13—1.

Kime, Donald L.: *See*—
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Koyo Fastener and Co., Ltd.: *See*—
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Krusinski, Raymond A., to Pretty Products, Inc. Sheet material. 232,596, 8–27–74, Cl. D87—3.

Krusinski, Raymond A., and C. A. Wells, to Pretty Products, Inc. Automobile floor mat. 232,534, 8–27–74, Cl. D12—203.

Krusinski, Raymond A., and C. A. Wells, to Pretty Products, Inc. Automobile floor mat. 232,535, 8–27–74, Cl. D12—203.

Krusinski, Raymond A., and C. A. Wells, to Pretty Products, Inc. Automobile floor mat. 232,536, 8–27–74, Cl. D12—203.

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Krusinski, Raymond A., C. A. Wells, and R. A. O'Neil, to Pretty Products, Inc. Automobile floor mat. 232,539, 8–27–74, Cl. D12—203.

Krusinski, Raymond A., C. A. Wells, and R. A. O'Neil, to Pretty Products, Inc. Automobile floor mat. 232,540, 8–27–74, Cl. D12—203.

Kucera, Joseph B., ¼ interest of Rudolph L. Lowell. Educational toy car. 232,570, 8–27–74, Cl. D34—15.

Landherr, Lawrence R., to Milwaukee Cylinder Corp. Combined hydraulic cylinder and control valve unit. 232,579, 8–27–74, Cl. D35—1.

Langieri, Michael, to Questor Corp. Zoo toy. 232,575, 8–27–74, Cl. D34—15.

Langieri, Michael, to Questor Corp. Spinning toy. 232,576, 8–27–74, Cl. D34—15.

Lea, Melvin A. Spoon or similar article. 232,512, 8–27–74, Cl. D7—137.

Lea, Melvin A., to Oneida, Ltd. Spoon or similar article. 232,513, 8–27–74, Cl. D7—137.

Levine, Robert, to Capehart Corp. Cabinet. 232,503, 8–27–74, Cl. D6—154.

Liakouras, Chris: *See*—
Liakouras, Chris, and William. 232,510.

Liakouras, Chris, and William. Vertical cooking device. 232,510, 8–27–74, Cl. D7—110.

Long, William S., III. Carpet retainer. 232,545, 8–27–74, Cl. D13—7.

Longato, Giuseppe. Chair. 232,501, 8–27–74, Cl. D6—66.

Longrod, Scott J., to SCM Corp. Typebar control guide. 232,584, 8–27–74, Cl. D64—11.

Lowell, Rudolph L.: *See*—
Kucera, Joseph B. 232,570.

Maddock, Peter, and H. Sjoholm, to Telefonaktiebolaget L.M. Picture telephone. 232,560, 8–27–74, Cl. D26—14.

Maginniss, Hamilton J. Concrete vibrator. 232,580, 8–27–74, Cl. D55—1.

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175 3,832,246
3,832,247
187 3,832,248

CLASS 150

1.7 3,831,649
7 3,831,650
35 3,831,651
52G 3,831,652

CLASS 152

195 3,831,653
209 3,831,654
210 3,831,655
361FP 3,831,656
3,831,657
427 3,831,658

CLASS 156

39 3,832,250
60 3,832,251
86 3,832,252
3,832,253
107 3,832,254
148 3,832,255
179 3,832,256
198 3,832,257
257 3,832,258
293 3,832,259
390 3,832,260
405 3,832,261
467 Re.28,139
468 3,832,262

CLASS 161

37 3,832,263
41 3,832,264
92 3,832,265
93 3,832,266
116 3,832,267
162 3,832,268
3,832,269
165 3,832,270
170 3,832,271
173 3,832,272
182 3,832,273
183 3,832,274
190 3,832,275

CLASS 162

65 3,832,276
70 3,832,277
80 3,832,278
82 3,832,279
154 3,832,280
157C 3,832,281
203 3,832,282
211 3,832,283

CLASS 164

82 3,831,659
275 3,831,660
282 3,831,661
362 3,831,662

CLASS 165

26 3,831,663
39 Re.28,136
80 3,831,664
87 3,831,665
89 3,831,666
96 3,831,667
107 3,831,668
122 3,831,669
124 3,831,670
154 3,831,671
3,831,672
158 3,831,673
166 3,831,674
177 3,831,675

CLASS 166

82 3,831,676
128 3,831,677
288 3,831,678
307 3,831,679
311 3,831,680

CLASS 169

16 3,831,681
37 3,831,682

CLASS 172

4.5 3,831,683
248 3,831,684
568 3,831,685

CLASS 173

132 3,831,686

CLASS 174

52S 3,832,480
102R 3,832,481
141R 3,832,482

CLASS 177

210 3,831,687
229 3,831,688

CLASS 178

5.4CD 3,832,483
5.4F Re.28,132
6.6B 3,832,484
6.8 3,832,485
7.1 3,832,486
7.2 3,832,487
15 3,832,488
68 3,832,490
71R 3,832,489

CLASS 179

1VC 3,832,491
15AS 3,832,493
15AT 3,832,492
15BA 3,832,494
18GF 3,832,495
18J 3,832,496
90D 3,832,497
98 3,832,498
115.5PV 3,832,499
186E 3,832,500

CLASS 180

1R 3,831,689
6.66 3,831,690
8C 3,831,691
14A 3,831,693
14R 3,831,692
19R 3,831,694
44R 3,831,695
68P 3,831,696
77R 3,831,698
77S 3,831,699
79.2R 3,831,697
3,831,700
3,831,701
82C 3,831,702
82R 3,831,703
89R 3,831,704
90 3,831,705
98 3,831,706
99 3,831,707
119 3,831,708
125 3,831,709

CLASS 181

33G 3,831,710

CLASS 182

40 3,831,711

CLASS 187

2 3,831,712
8.41 3,831,713
12 3,831,714
29R 3,831,715

CLASS 188

24 3,831,716
73.3 3,831,717
170 3,831,718
196F 3,831,719
343 3,831,720

CLASS 192

4C 3,831,721
18R 3,831,722
35 3,831,723
56C 3,831,724
87.13 3,831,725
103FA 3,831,726

CLASS 195

11 3,832,284
31R 3,832,285
80 3,832,286
81 3,832,287
139 3,832,288

CLASS 197

1R 3,831,727
3,831,728
3,831,729
98 3,831,730
168 3,831,731

CLASS 198

20R 3,831,732
32 3,831,733
36 3,831,735
41 3,831,736
57 3,831,737
255 3,831,734
279 3,831,738

CLASS 200

1R Re.28,134
51R 3,832,503
61.19 3,832,501
61.45R 3,832,507
82B 3,832,502
153SC 3,832,504
158 3,832,505
314 3,832,506
332 3,832,508

CLASS 202

174 3,832,289

CLASS 204

9 3,832,290
40 3,832,291
56R 3,832,292
3,832,293
64R 3,832,294
106 3,832,295
130 3,832,296
192 3,832,297
195P 3,832,298
256 3,832,299

CLASS 206

3 3,831,739
7K 3,831,740
150 3,831,741
219 3,831,742
338 3,831,743
386 3,831,744
520 3,831,745

CLASS 209

2 3,831,746
11 3,831,747
12 3,831,748
110.5 3,831,749
160 3,831,750
247 3,831,751
394 3,831,752
399 3,831,753

CLASS 210

21 3,832,300
58 3,832,301
80 3,831,754
108 3,831,755
109 3,831,756
143 3,831,757
199 3,831,758
232 3,831,759
242 3,831,760
274 3,831,761
297 3,831,762
321 3,831,763
376 3,831,764
484 3,831,765
508 3,831,766
526 3,831,767

CLASS 211

1 3,831,768
113 3,831,769

CLASS 212

42.5 3,831,770
55 3,831,771
84 3,831,772
139 3,831,773
145 3,831,774

CLASS 213

43 3,831,775
75TC 3,831,776
158 3,831,777

CLASS 214

1BD 3,831,778
1P 3,831,779
6BA 3,831,781
6DS 3,831,780
6P 3,831,782
7 3,831,783
3,831,784
8.5G 3,831,785
16.4A 3,831,786
23 3,831,787
42R 3,831,792
75T 3,831,788
82 3,831,789
83.24 3,831,790
396 3,831,791
454 3,831,793
516 3,831,794
731 3,831,795

CLASS 215

9 3,831,796
3,831,797
256 3,831,798

CLASS 219

7.5 3,832,509
69C 3,832,510
69P 3,832,511
73 3,832,512
75 3,832,513
76 3,832,514
81 3,832,516
92 3,832,517
98 3,832,515
110 3,832,518
121P 3,832,519
130 3,832,520
131 3,832,521
137 3,832,522
3,832,523
216 3,832,524
301 3,832,525
441 3,832,526
522 3,832,527

CLASS 220

4F 3,831,799
26R 3,831,800
39R 3,831,801
40R 3,831,802
46R 3,831,803
60R 3,831,804
94A 3,831,805

CLASS 221

1 3,831,806
197 3,831,808
227 3,831,809
301 3,831,810

CLASS 222

1 3,831,811
20 3,831,812
81 3,831,813
3,831,814
94 3,831,815
135 3,831,816
143 3,831,817
145 3,831,818
176 3,831,819
182 3,831,820
255 3,831,821
397 3,831,822
490 3,831,823
525 3,831,824
561 3,831,825

CLASS 223

88 3,831,826

CLASS 224

25A 3,831,827

CLASS 226

16 3,831,828
83 3,831,829
171 3,831,830
198 3,831,831

CLASS 229

8 3,831,832
17M 3,831,833
23R 3,831,834
37R 3,831,835
49 3,831,836
51TS 3,831,837

CLASS 232

43.2 3,831,838

CLASS 235

54R Re.28,138
61.11E 3,832,528
3,832,529
61.11H 3,832,530
88 3,831,839
89R 3,831,840
92PD 3,832,531
151.21 3,832,533
3,832,534
151.3 3,832,532
153AC 3,832,535
183 3,832,536
193 3,832,537

CLASS 236

13 3,831,841

CLASS 238

349 3,831,842

CLASS 239

1 3,831,847
8 3,831,843
14 3,831,844
76 3,831,845
89 3,831,846
104 3,831,848
127 3,831,849
144 3,831,850
175 3,831,851
201 3,831,852
230 3,831,853
406 3,831,854
416 3,831,855
422 3,831,856
424 3,831,857
464 3,831,858
500 3,831,860
520 3,831,861
526 3,831,862
533 3,831,863
592 3,831,859
665 3,831,864

CLASS 240

25 3,832,538
41.3 3,832,539
51.11R 3,832,540
106R 3,832,541

CLASS 241

32 3,831,865
63 3,831,866
101.7 3,831,867
245 3,831,868

CLASS 242

3 Re.28,133
18DD 3,831,869
18A 3,831,870
25R 3,831,871
43 3,831,872
45 3,831,873
47.01 3,831,874
47.13 3,831,875
58.3 3,831,876
86.5R 3,831,877
107.4 3,831,878
129 3,831,879
156 3,831,880
194 3,831,881
199 3,831,882
207 3,831,883

CLASS 244

12C 3,831,884
40A 3,831,885
42CC 3,831,886
3,831,887
54 3,831,888
114 3,831,889

CLASS 245

2 3,831,890

CLASS 248

44 3,831,891
201 3,831,892
223 3,831,893
327 3,831,894
475R 3,831,895
479 3,831,896

CLASS 249

1 3,831,897
65 3,831,898
97 3,831,899

CLASS 250

199 3,832,543
202 3,832,544
312 3,832,545
315 3,832,546
319 3,832,547
343 3,832,548
358 3,832,549
3,832,550
359 3,832,551
363 3,832,542
381 3,832,552
406 3,832,553
423 3,832,554
458 3,832,555
461 3,832,557
3,832,558
462 3,832,556
468 3,832,559
492 3,832,560
3,832,561
503 3,832,562
506 3,832,563
510 3,832,564
566 3,832,565

CLASS 251

122 3,831,900

CLASS 252

46.6 3,832,302
51.5A 3,832,303
158 3,832,304
175 3,832,305
422 3,832,306
455Z 3,832,307
514 3,832,308
527 3,832,309
543 3,832,310

CLASS 254

93R 3,831,901
105 3,831,902

CLASS 259

1R 3,831,903
4 3,831,904
3,831,905
6 3,831,906
7 3,831,907
191 3,831,908

CLASS 260

2.5AT 3,832,311
2.5HB 3,832,312
9 3,832,313
26 3,832,314
28.5R 3,832,315
29.4R 3,832,316
29.6RB 3,832,317
29.7UP 3,832,318
31.2R 3,832,319
32.6NT 3,832,320
33.8UA 3,832,321
37N 3,832,322
3,832,323
38 3,832,324
3,832,325
42.29 3,832,326
42.37 3,832,327
45.85B 3,832,328
47CP 3,832,330
47C 3,832,329
49 3,832,331
77.5C 3,832,333
78R 3,832,332
78.5R 3,832,334
80.81 3,832,335
89.1 3,832,336
112.5 3,832,337
113 3,832,338
144 3,832,339
210E 3,832,340
211.5R 3,832,341
233.5 3,832,342
236.5 3,832,343
239BD 3,832,344
239A 3,832,347
239.3R 3,832,348
239.5 3,832,345
3,832,346
240D 3,832,349
3,832,350
294.8E 3,832,351
309.7 3,832,352
327TH 3,832,353
332.2A 3,832,354
340.7 3,832,355
340.9 3,832,356
345.7 3,832,358
345.9 3,832,357
346.3 3,832,360
346.8 3,832,359
348R 3,832,362
348.5V 3,832,363
349 3,832,361
378 3,832,364
396R 3,832,365
397.45 3,832,366
404 3,832,367
3,832,368
410.9N 3,832,369
429.7 3,832,370
439R 3,832,371
453PC 3,832,372
453R 3,832,373
455A 3,832,374
463 3,832,375
465D 3,832,377
465.1 3,832,378
468D 3,832,379
3,832,380
468K 3,832,381
468.5 3,832,382
469 3,832,376
3,832,383
470 3,832,384
3,832,385
471A 3,832,387
3,872,388
471R 3,832,386
479C 3,832,389
487 3,832,390
497A 3,832,391
502A 3,832,392
502.5 3,832,393
3,832,394
3,832,398
3,832,395
545P 3,832,396
553D 3,832,397
566AC 3,832,400
566D 3,832,399
570.8R 3,832,401
584E 3,832,402
592 3,832,403
604HF 3,832,404
612R 3,832,405

614R 3,832,40
615B 3,832,407
3,832,408
619A 3,832,409
646 3,832,410
653.3 3,832,411
654R 3,832,412
673 3,832,413
673.5 3,832,414
678 3,832,415
681.5R 3,832,416
683D Re.28,137
3,832,417
683.15R 3,832,418
824R 3,832,419
825 3,832,420
859R 3,832,421
876R 3,832,422
878R 3,832,423
959 3,832,424
3,832,425

CLASS 261

39A 3,831,909
3,831,910

CLASS 264

29 3,832,426
39 3,832,427
48 3,832,428
51 3,832,429
3,832,430
75 3,832,431
117 3,832,434
143 3,832,433
168 3,832,435
210F 3,832,436
248 3,832,437
249 3,832,432
274 3,832,438

CLASS 266

21 3,831,911
22 3,831,912
24 3,831,913
25 3,831,914
34R 3,831,915
36P 3,831,916
3,831,917
41 3,831,918

CLASS 267

34 3,831,919
137 3,831,920
139 3,831,921
140 3,831,922
141 3,831,923
154 3,831,924
156 3,831,925

CLASS 269

228 3,831,926

CLASS 270

79 3,831,927

CLASS 271

35 3,831,928
64 3,831,929
91 3,831,930
126 3,831,931
182 3,831,932
258 3,831,933

CLASS 272

56 3,831,934
57B 3,831,935
65 3,831,936
70.1 3,831,937

CLASS 273

1R 3,831,938
48 3,831,939
55B 3,831,940
55R 3,831,941
73 3,831,942
106A 3,831,943
131BB 3,831,944
134AD 3,831,946
143R 3,831,947
145R 3,831,948
148R 3,831,945
176H 3,831,949

CLASS 277

75 3,831,950
170 3,831,951
171 3,831,952
180 3,831,953

207 3,831,954

CLASS 279

2A 3,831,955

CLASS 280

11.35D 3,831,956
11.35T 3,831,957
36C 3,831,958
79.1 3,831,959
3,831,960
81A 3,831,961
3,831,962
3,831,963
3,831,964
96.2R 3,831,965
124A 3,831,967
3,831,970
124B 3,831,966
124F 3,831,968
3,831,969
150AB 3,831,972
3,831,973
150SB 3,831,971
3,831,974
150B 3,831,975
179A 3,831,976
229 3,831,977
238 3,831,978
279 3,831,979
402 3,831,980
479R 3,831,981
511 3,831,982

CLASS 285

12 3,831,983
73 3,831,984
162 3,831,985

CLASS 292

201 3,831,986
246 3,831,987
302 3,831,988
338 3,831,989

CLASS 293

1 3,831,990

CLASS 294

64R 3,831,991
65 3,831,992
81R 3,831,993
82R 3,831,994
90 3,831,995

CLASS 296

19 3,831,996
28R 3,831,997
35R 3,831,998
3,831,999
65A 3,832,000

CLASS 297

188 3,832,001
216 3,832,002
3,832,003

CLASS 302

28 3,832,004
59 3,832,005
60 3,832,006

CLASS 303

6C 3,832,007
21BE 3,832,008
21EB 3,832,010
21F 3,832,012
21P 3,832,009
3,832,011
3,832,013
22R 3,832,014
40 3,832,015
3,832,016
68 3,832,017

CLASS 305

39 3,832,018

CLASS 307

88LC 3,832,566
88.3 3,832,567
106 3,832,568
3,832,572
110 3,832,569
116 3,832,570
154 3,832,571
202 3,832,573
205 3,832,574
208 3,832,575
209 3,832,576

235R 3,832,577
279 3,832,578

CLASS 308

3A 3,832,019
6C 3,832,020
36.1 3,832,021
3,832,022
201 3,832,023
236 3,832,024

CLASS 310

8.1 3,832,579
9.5 3,832,580
46 3,832,581
90 3,832,582
201 3,832,583
211 3,832,584

CLASS 312

297 3,832,025

CLASS 313

118 3,832,586
184 3,832,587
217 3,832,588
3,832,589
218 3,832,590
229 3,832,591
371 3,832,585
404 3,832,592

CLASS 315

3.5 3,832,593
3,832,596
13C 3,832,594
27TD 3,832,595
82 3,832,597

CLASS 317

2B 3,832,598
5 3,832,599
14D 3,832,600
27R 3,832,601
101D 3,832,603
101R 3,832,602
120 3,832,604
3,832,605
234R 3,832,606
261 3,832,607

CLASS 318

37 3,832,608
52 3,832,609
135 3,832,610
171 3,832,611
221E 3,832,612
269 3,832,613
313 3,832,614
481 3,832,615
576 3,832,616
673 3,832,617
676 3,832,618

CLASS 321

5 3,832,619
3,832,620
11 3,832,621
27R 3,832,622
45R 3,832,623
66 3,832,624

CLASS 322

47 3,832,625

CLASS 323

4 3,832,626
22T 3,832,627

CLASS 324

16R 3,832,628
29.5 3,832,629
56 3,832,630
3,832,631
158P 3,832,632
158T 3,832,633
160 3,832,634
166 3,832,635

CLASS 325

25 3,832,636
30 3,832,637
347 3,832,638

CLASS 328

14 3,832,639
38 3,832,640
258 3,832,641

CLASS 330

2 3,832,642
15 3,832,643
22 3,832,644

29 3,832,645
30D 3,832,646
30R 3,832,647

CLASS 331

74 3,832,648
94.5L 3,832,649
94.5P 3,832,650
107G 3,832,651
3,832,652
116R 3,832,653

CLASS 333

24R 3,832,654
30R 3,832,655

CLASS 334

14 3,832,656

CLASS 335

99 3,832,657
181 3,832,658

CLASS 336

107 3,832,659
150 3,832,660
212 3,832,661

CLASS 337

40 3,832,662
112 3,832,663
241 3,832,664
244 3,832,665
272 3,832,666
354 3,832,667

CLASS 338

22SD 3,832,668
28 3,832,669
124 3,832,670
188 3,832,671

CLASS 339

13 3,832,672
21R 3,832,673
60R 3,832,674
143R 3,832,675
147P 3,832,676

CLASS 340

15.5TN 3,832,677
22 3,832,679
56 3,832,680
58 3,832,681
146.1AB 3,832,684
146.2 3,832,685
146.3ED 3,832,682
146.3MA 3,832,683
3,832,687
146.3Z 3,832,686
147LP 3,832,689
147R 3,832,688
168R 3,832,690
171R 3,832,691
172.5 3,832,692
3,832,693
3,832,694
3,832,695
3,832,696
3,832,697
173DR 3,832,699
173LT 3,832,698
173.2 3,832,700
174TF 3,832,701
227R 3,832,678
244R 3,832,702
248R 3,832,703
258R 3,832,704
280 3,832,705
324M 3,832,706
347DA 3,832,707
352 3,832,708

CLASS 343

5PD 3,832,709
5SM 3,832,710
6DF 3,832,711
17.7 3,832,712
100SA 3,832,713
713 3,832,714
761 3,832,715
770 3,832,716
840 3,832,717

CLASS 346

74MT 3,832,718
75 3,832,719

CLASS 350

3.5 3,832,026
3,832,027

96WG 3,832,028
3,832,030
96T 3,832,029
117 3,832,031
128 3,832,032
160LC 3,832,033
3,832,034
189 3,832,035
214 3,832,037
236 3,832,038
295 3,832,039
310 3,832,040

CLASS 351

1 3,832,041
6 3,832,042
123 3,832,043

CLASS 352

14 3,832,044
25 3,832,045
69 3,832,046
109 3,832,047
130 3,832,048
166 3,832,036

CLASS 353

19 3,832,049
42 3,832,050
86 3,832,051

CLASS 354

21 3,832,721
29 3,832,722
51 3,832,052
3,832,723
63 3,832,724
64 3,832,720
3,832,725
187 3,832,726
196 3,832,727
210 3,832,728
213 3,832,729
299 3,832,730
304 3,832,731

CLASS 355

3R 3,832,053
3,832,055
8 3,832,057
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	358	232,498		63	232,516			232,533		4	232,551		GT	232,568			232,585
D6—	33	232,499		166	232,517			232,534		40	232,552		SS	232,569		B	232,586
	47	232,500		246	232,518			232,535		45	232,553		15AF	232,572	D77—	1R	232,600
	66	232,501		271	232,519			232,536		162	232,554		AJ	232,570	D83—	C	232,590
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	154	232,503		96	232,520			232,538	D26—	G	232,558		A	232,575		F	232,587
	177	232,504		168	232,521			232,539		R	232,556		C	232,574			232,589
	184	232,506		177	232,522			232,540			232,557		M	232,571		12R	232,591
	188	232,505		183	232,523	D13—	1A	232,542		5C	232,559		T	232,573	D87—	I	232,592
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38 : 3,832,093
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39 : 3,831,244
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3,832,595	3,831,233	3,831,386	3,832,295	3,832,005	3,831,268
3,832,599	3,831,248	3,831,432	3,832,323	3,832,165	3,831,548
3,832,600	3,831,368	3,831,604	3,832,402	3,832,531	3,831,574
3,832,618	3,831,639	3,831,624	3,832,576	3,832,574	3,831,595
3,832,625	3,831,987	3,831,632	3,832,608	3,832,703	3,831,692
3,832,637	3,832,258	3,831,677	3,832,667	52 : 3,832,128	3,831,704
3,832,646	3,832,270	3,831,678	3,832,674	53 : 3,831,204	3,831,725
3,832,649	46 : 3,831,785	3,831,684	3,832,734	3,831,238	3,831,859
3,832,668	3,832,633	3,831,730	49 : Re.28,134	3,831,376	3,831,866
3,832,687	47 : 3,831,392	3,831,747	3,831,305	3,831,484	3,831,906
3,832,694	3,831,501	3,831,791	3,831,522	3,831,577	3,832,081
3,832,700	3,831,587	3,831,812	3,831,789	3,831,664	3,832,507
3,832,702	3,831,806	3,831,831	3,831,800	3,831,708	3,832,598
3,832,732	3,831,950	3,831,833	3,832,296	3,831,885	3,832,603
43 : 3,832,162	3,832,043	3,831,845	50 : 3,832,330	3,832,201	3,832,624
44 : 3,831,362	3,832,056	3,831,982	51 : Re.28,141	3,832,313	3,832,670
3,831,592	3,832,118	3,832,070	3,831,421	3,832,439	3,832,688
3,831,873	3,832,426	3,832,071	3,831,549	3,832,658	3,832,709
3,832,643	48 : Re.28,138	3,832,073	3,831,734	3,832,677	3,832,710
3,832,666	3,831,299	3,832,191	3,831,838	55 : 3,831,234	56 : 3,831,383
45 : Re.28,139	3,831,310	3,832,204	3,832,004		

DESIGN PATENTS

1 : 232,505	232,561	232,591	232,544	39 : 232,515	232,566
6 : 232,500	232,587	29 : 232,496	232,556	232,518	232,580
232,524	18 : 232,497	33 : 232,521	232,557	232,530	232,581
232,547	232,529	34 : 232,509	232,558	232,531	232,588
232,567	232,541	232,545	232,559	232,532	232,595
232,573	232,562	232,546	232,563	232,533	232,596
232,586	232,590	232,564	232,574	232,534	41 : 232,582
232,600	19 : 232,570	232,575	232,583	232,535	42 : 232,504
9 : 232,498	20 : 232,528	232,576	232,584	232,536	232,555
13 : 232,551	232,577	232,592	232,585	232,537	232,565
17 : 232,510	25 : 232,508	36 : 232,503	232,593	232,538	47 : 232,548
232,520	232,571	232,512	232,594	232,539	232,572
232,523	26 : 232,514	232,513	232,597	232,540	51 : 232,568
232,525	232,578	232,526	232,599	232,552	53 : 232,569
232,527	27 : 232,511	232,542	37 : 232,507	232,553	55 : 232,579
232,554	232,589	232,543	232,517		

PLANT PATENTS

6 : 3,599	3,601	3,603			

U. S. GOVERNMENT PRINTING OFFICE : O - 1974

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, *Secretary*

PATENT OFFICE
C. Marshall Dann, *Commissioner*